Arithmetic

4

THE WORLD OF NUMBERS

Carpenter • Anderson

ARITHMETIC 4

THE WORLD OF NUMBERS

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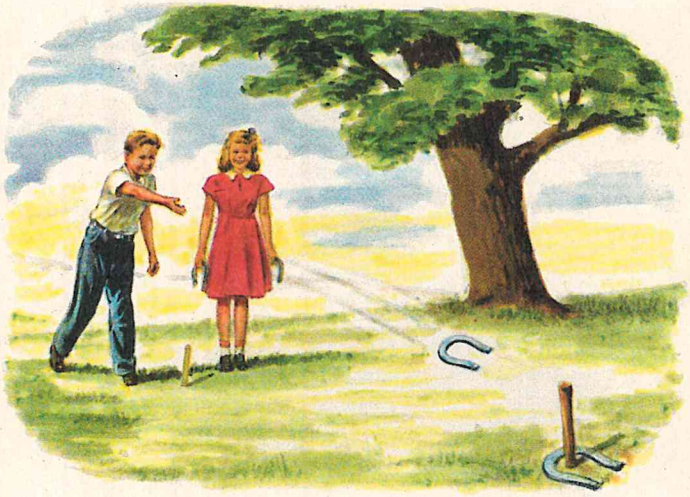

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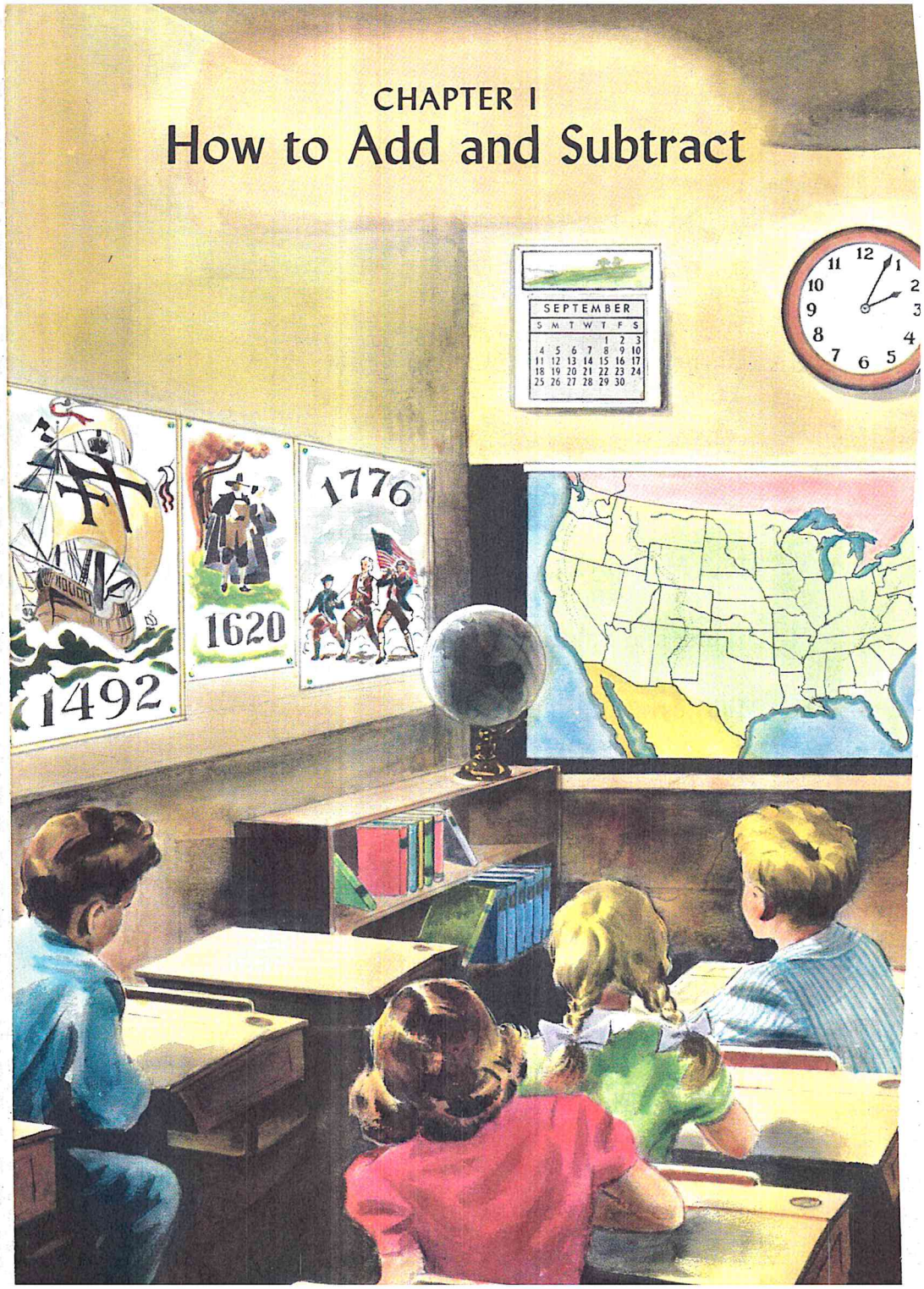
CONTENTS

CHAPTER		PAGE
I.	How to Add and Subtract	1
II.	How to Multiply and Divide	32
III.	Multiplying and Dividing the Fours and Fives	56
IV.	Multiplying and Dividing the Sixes and Sevens	96
V.	More Multiplying and Dividing	128
VI.	Adding and Subtracting Larger Numbers	160
VII.	Multiplying and Dividing the Eights and Nines	196
VIII.	Fractions	228
IX.	Harder Multiplication and Division	256
X.	Thinking About This Book	288
	Tables of Measures	308
	Number Facts	309
	Index	313

CHAPTER I

How to Add and Subtract



GETTING STARTED

Does the picture of the schoolroom look like your schoolroom?

1. Look at each of these things in the picture and tell how numbers are used with them:

a. Calendar **b.** Clock **c.** Map

2. How many shelves for books do you see in the picture? How many books are there on each shelf? How many books in all are there on the shelves?

3. Make an addition problem that shows the number of books on the shelves. Have the class work it.

4. Make an addition problem about some things in your schoolroom. Have the class work it.

5. Make a multiplication problem about some things in your schoolroom. Have the class work it.

6. Look at the posters in the picture. Read the date on each. Write these dates in words.

7. What year is this? What month? What day of the month? Give the day's name and its number in the month.

8. Give the year, month, and day on which you were born.

9. Write as long a list as you can of ways in which arithmetic makes your work and play easier. The questions below will help you start.

Could you find your place in a book very easily if the pages were not numbered?

Would you be late to school oftener if clocks did not tell the time?

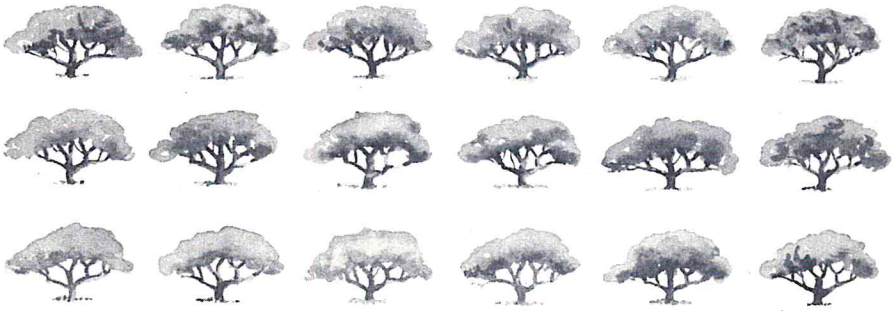
Do numbers help you to keep score for a game?

ARITHMETIC ON THE FARM

Dick, Harry, and Sue went to their Uncle Phil's farm for the summer. When they came back to school in September they told their friends and teachers about the farm.

1. Uncle Phil has 20 milk cows, 40 pigs, 22 sheep, 4 horses, and 1 pony. Sue knew how many of these animals there were all together on the farm. How many were there?

2. Uncle Phil's apple orchard has 18 trees. Dick said it could have 2 rows with 9 trees in each row. Sue said it could have 6 rows with 3 trees in each row. Uncle Phil said there were 3 rows. How many trees were in each row?



3. Uncle Phil also said that his farm was 140 acres. He planted 20 acres of corn. He harvested 976 bushels. He planted 30 acres of wheat. He harvested 689 bushels. Write each of these numbers in words.

4. How does a farmer use arithmetic? Does the farmer have to count? What does he count? When does he add? subtract? multiply? divide?

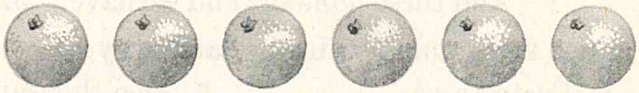
5. Does the farmer measure things? Name things he measures in bushels; acres; feet; miles; pounds. Give other names of amounts he measures.

★**6.** If you have visited a farm, tell about it. If you live on a farm, tell about it.

NUMBERS HAVE PLACE VALUE

Numbers tell us how much of something we have. Numbers tell us how many **ones** we have. We can draw pictures for numbers.

Ruth had six oranges. The number picture looks like this:

6 oranges = 

Nine figures and zero are used in our number system. When we have more than nine of something we have to use more than one figure to tell how many things we have. When we have one more than nine we have **one ten.** We write the number this way: **10.** The **1** is in the tens' place. The **0** tells us that we have no ones.

Our number system has nine figures and zero. The place of the figure tells us how much each figure stands for.

We can use marks to show what numbers stand for. This is a picture for 13:

13 = | | | | | | | | | | | | | | | one ten and three ones

The figure **1** in 13 means one ten. The figure **3** means three ones. The 3 is in the ones' place. The 1 is in the tens' place. 13 means 1 ten and 3 ones.

This is the picture for 27 marbles:

27 marbles = 2 tens and 7 ones

In any number the places of the figures tell us how many the number means.

MORE ABOUT PLACE VALUE

What does the number 5296 mean?

5296 means:	5 thousands,	or	5000
	2 hundreds,	or	200
	9 tens,	or	90
	and 6 ones,	or	6
	Add these numbers and we have:		5296

Write these numbers in the same way:

1. Forty-three
2. Eight hundred two
3. Six hundred ninety
4. Three thousand, ninety
5. One thousand, four hundred
6. Seven thousand, five hundred twenty-six

7. What figure tells the number of ones in the number in Exercise **1?**

8. What figure tells the number of tens in the number in Exercise **2?**

9. What figure tells the number of hundreds in the number in Exercise **3?**

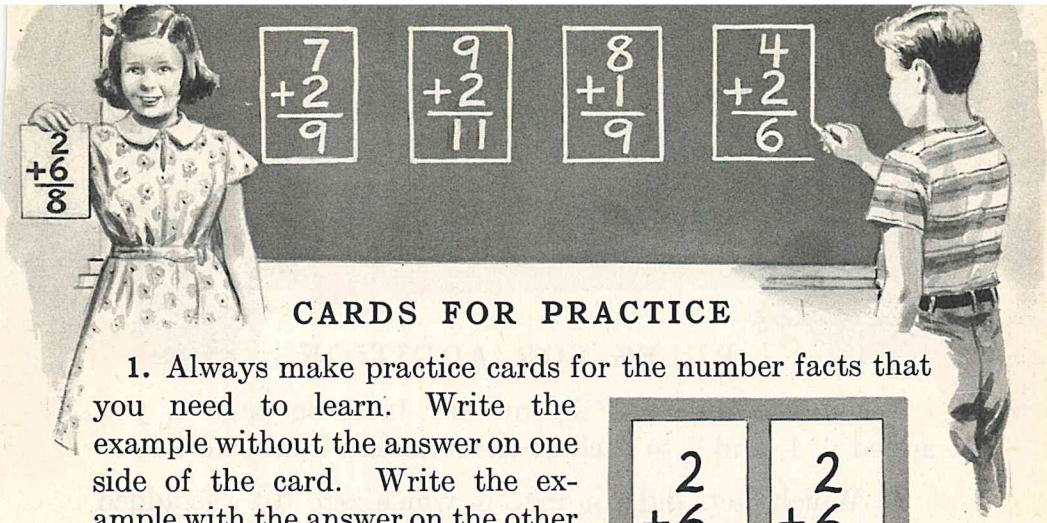
10. What figures tell the number of tens, hundreds, and thousands in the numbers in Exercises **4, 5,** and **6?**

COUNTING

1. Sue counted by 2's the ducks on Uncle Phil's farm. There were forty. Count to forty by 2's.

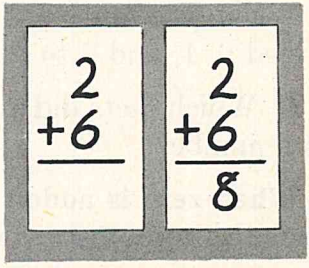
2. Harry found a pile of bricks. He arranged them neatly in rows of 5. He had 13 rows. Count by 5's until you have counted thirteen 5's. How many bricks were there?

3. Dick said that it was easy to count the tomato plants in the garden. There were 10 in each row and 16 rows. Count by 10's until you know how many tomato plants there were all together.



CARDS FOR PRACTICE

1. Always make practice cards for the number facts that you need to learn. Write the example without the answer on one side of the card. Write the example with the answer on the other side. The two sides of the card will look like this:



2. Practice with the cards until you know all the facts and can say them quickly. Do not look at the answer unless you need to. You may test yourself or play a game with someone.

ADDITION PROBLEMS

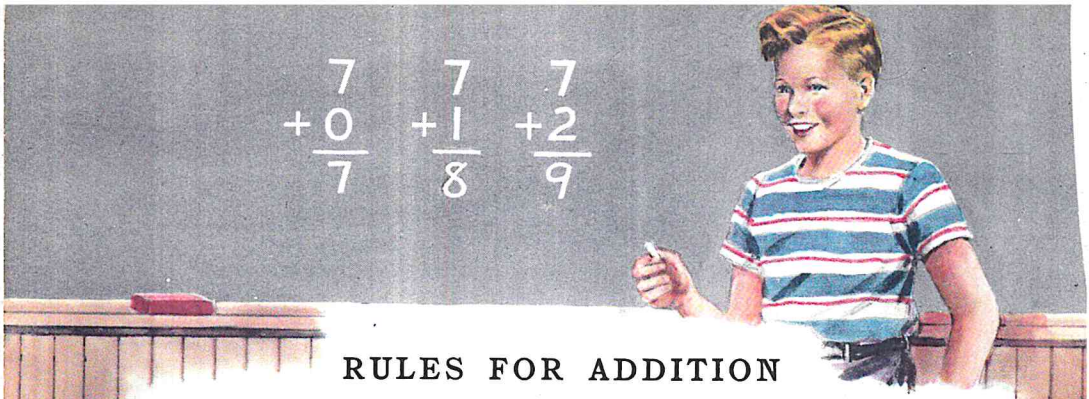
Write your work and the answers to these problems:

1. Carl paid 5¢ for a pencil and 2¢ for an eraser. How much did the pencil and eraser cost together?

2. When Sally went to gather eggs in the morning, she did not find any. When she gathered them in the evening, she found 8. How many did she gather all together?

3. Tom had a mother duck and seven baby ducks. How many ducks were there in all?

4. Don's father owned a ranch. He had 9 black ponies and 2 brown ponies. How many ponies did Don's father have?



RULES FOR ADDITION

When you reviewed the number facts on page 6, you added 0, 1, and 2 to each of the numbers from 0 to 9.

1. Which facts did you miss in which zero (0) was added to a number?

When zero is added to a number, or when a number is added to zero, the answer, or sum, is that number.

2. Which facts did you miss in which one (1) was added to a number?

When we add 1 to a number, the sum is the next larger number.

3. Which facts did you miss in which two (2) was added to a number?

When we add 2 to a number, we count up 2 from that number.

When we add two numbers, we never get a smaller number.

Without Paper and Pencil

Being able to count helps us to add.

1. Beginning with 1, count by 3's to 31. Count 1, 4, 7, and so on to 31.

2. Beginning with 2, count by 3's until you reach 32.

WORDS THAT TELL HOW MUCH

1. How many are a pair? a dozen? twins? Does a **pair** tell you exactly how many?

2. How much is some? few? many? Does **some** tell you exactly how many?

3. Would you rather have:

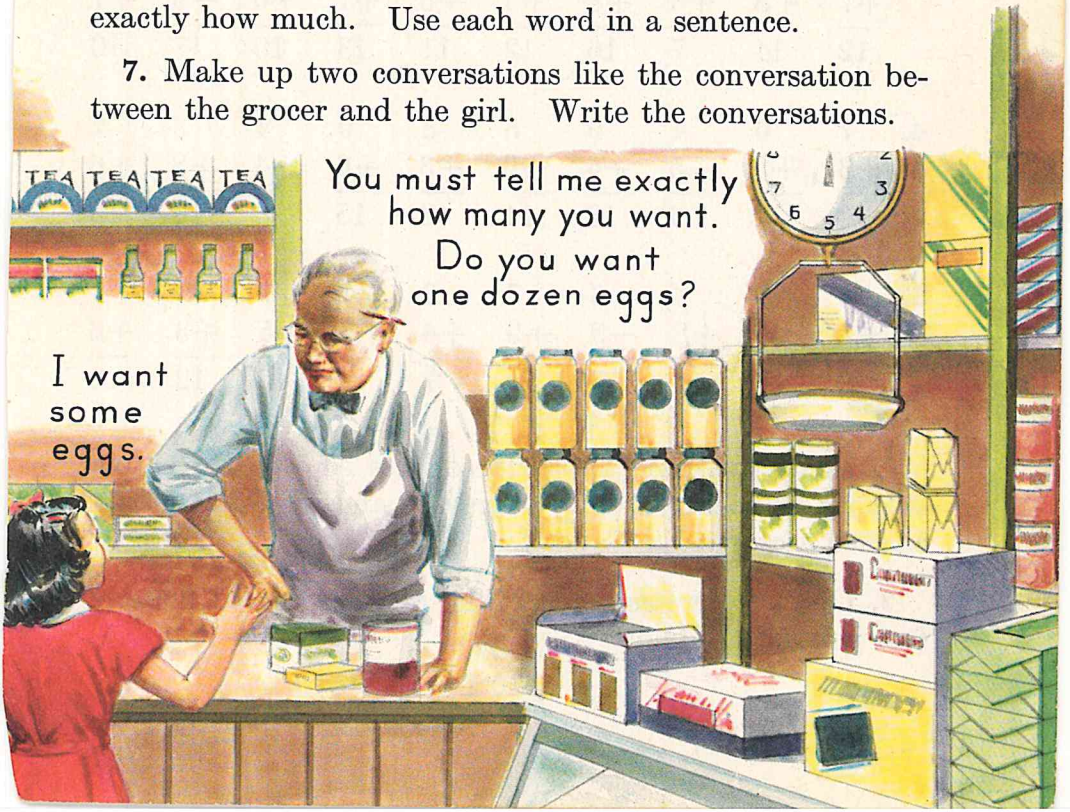
- **a. some** apples or **five** apples?
- **b.** a **few** marbles or **six** marbles?
- **c. three** balloons or **several** balloons?
- **d. two** pieces of cake or a **lot** of cake?

4. Why are **exact** words and numbers better? Why do we use words which are **not exact?**

5. Write five words that tell how much but not exactly how much. Use each word in a sentence.

6. Write five words that are not numbers but do tell exactly how much. Use each word in a sentence.

7. Make up two conversations like the conversation between the grocer and the girl. Write the conversations.



HARDER ADDITION FACTS

(Addition facts with 3, 4, 5, 6, 7, 8, and 9)

Study these addition facts. Say them to yourself. Begin, "Eight plus three is eleven."

	a	b	c	d	e	f	g	h	i	j
1.	8	8	3	8	3	6	5	9	5	6
	+3	+7	+9	+5	+3	+6	+4	+7	+5	+3
	11	15	12	13	6	12	9	16	10	9
2.	3	4	8	7	3	9	9	3	7	7
	+8	+9	+6	+7	+6	+8	+9	+5	+9	+4
	11	13	14	14	9	17	18	8	16	11
3.	5	6	4	8	8	5	6	4	8	3
	+7	+8	+3	+8	+4	+6	+7	+6	+9	+7
	12	14	7	16	12	11	13	10	17	10
4.	7	6	4	9	5	5	9	4	5	7
	+3	+5	+5	+4	+9	+3	+6	+4	+8	+6
	10	11	9	13	14	8	15	8	13	13
5.	6	9	4	6	7	3	4	7	9	7
	+4	+5	+8	+9	+9	+4	+7	+5	+3	+8
	10	14	12	15	16	7	11	12	12	15

6. After you have studied these facts, copy each example without its answer. Close your book and write the answer to each example.

7. Check your answers. Make a practice card for any fact you did not know.

EASY SUBTRACTION FACTS

(Subtraction facts with 0, 1, and 2)

Study these subtraction facts. Say them to yourself. Begin, "One minus one is zero."

	a	b	c	d	e	f	g	h	i	j
1.	1	3	3	5	1	4	2	4	2	0
	−1	−1	−2	−0	−0	−2	−0	−1	−2	−0
	0	2	1	5	1	2	2	3	0	0
2.	2	5	3	5	5	4	3	6	4	5
	−1	−4	−3	−2	−1	−3	−0	−2	−0	−5
	1	1	0	3	4	1	3	4	4	0
3.	8	5	7	6	4	6	6	8	9	7
	−6	−3	−0	−4	−4	−5	−6	−2	−0	−7
	2	2	7	2	0	1	0	6	9	0
4.	6	7	6	9	8	9	8	9	10	11
	−1	−6	−0	−2	−0	−1	−7	−8	−2	−9
	5	1	6	7	8	8	1	1	8	2
5.	7	7	9	8	9	10	10	10	11	7
	−2	−5	−7	−8	−9	−9	−8	−1	−2	−1
	5	2	2	0	0	1	2	9	9	6

6. After you have studied these facts, copy each example without its answer. Close your book and write the answer to each example.

7. Check your answers. Look at the bottom of page 20 if you have forgotten how to check subtraction examples. Make a practice card for any fact you did not know.

RULES FOR SUBTRACTION

Did you notice that the facts you have just reviewed subtract 0, 1, or 2 from the numbers 1 to 11 or have answers that are 0, 1, or 2?

Subtraction means to take away. The answer is called the remainder or the difference.

1. Did you miss any facts in which zero (0) was subtracted from a number?

When we subtract zero from a number, the remainder is that number.

2. Did you miss any facts in which one (1) was subtracted from a number?

When we subtract 1 from a number, we count back 1 from that number.

3. Did you miss any facts in which two (2) was subtracted from a number?

When we subtract 2 from a number, we count back 2 from that number.

We check subtraction by adding.

Add 2 and 4. Does the answer check?

$$\begin{array}{r} 6 \\ -4 \\ \hline 2 \end{array}$$

HARDER SUBTRACTION FACTS

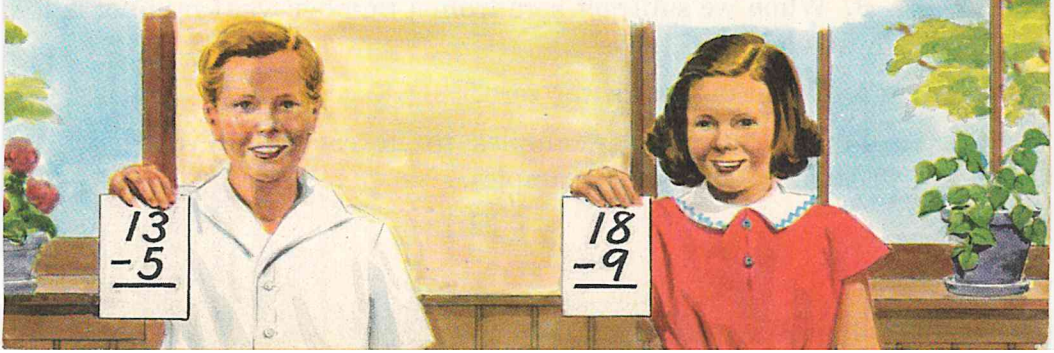
(Subtraction facts with 3, 4, 5, 6, 7, 8, and 9)

Study these subtraction facts. They are harder. Say them to yourself. Begin, "Six minus three is three."

	a	b	c	d	e	f	g	h	i	j
1.	6	8	9	10	7	11	8	9	11	9
	−3	−4	−3	−3	−4	−5	−3	−5	−6	−6
	3	4	6	7	3	6	5	4	5	3
2.	11	7	9	11	10	11	8	12	13	10
	−4	−3	−4	−7	−5	−3	−5	−3	−4	−7
	7	4	5	4	5	8	3	9	9	3
3.	12	10	12	11	12	10	13	14	12	16
	−5	−4	−6	−8	−4	−6	−5	−7	−8	−9
	7	6	6	3	8	4	8	7	4	7
4.	14	13	14	12	15	14	17	12	16	17
	−9	−8	−6	−7	−6	−5	−9	−9	−8	−8
	5	5	8	5	9	9	8	3	8	9
5.	13	15	14	13	16	13	16	18	15	15
	−6	−7	−8	−9	−9	−7	−7	−9	−9	−8
	7	8	6	4	7	6	9	9	6	7

6. After you have studied these facts, copy each example without its answer. Close your book and write the answer to each example.

7. Check your answers. Make a practice card for any fact you did not know.



ADDITION AND SUBTRACTION FAMILIES

Do you remember the addition and subtraction families? Here is the family for 4, 7, and 11.

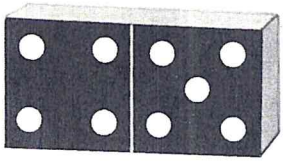
$$4 + 7 = 11 \qquad 11 - 4 = 7$$
$$7 + 4 = 11 \qquad 11 - 7 = 4$$

1. Tell how you can find a subtraction fact if you know the right addition fact.

2. Make the addition and subtraction families for:

a. 3, 5, and 8
b. 6, 2, and 8
c. 7, 5, and 12
d. 4, 9, and 13
e. 15, 6, and 9
f. 12, 4, and 8
g. 2, 9, and 11
h. 17, 9, and 8

3. How does this domino tell the story of the addition and subtraction family for 4, 5, and 9?



OTHER SUBTRACTION RULES

Write the rules for subtraction which answer these questions:

1. What is the answer when we subtract all of a number of things?

2. When is the answer one?

3. When we subtract zero from a number what number is always left?

4. When is the answer zero?

5. Make up two examples to fit each rule you have written. Work your examples.

BORROWING FROM THE TENS

Alice planted tulip bulbs in her garden. She had 43 bulbs. She planted 27 in the first bed. Can you tell how many bulbs she had for the second bed?

43	= 4 tens 3 ones	= 3 tens 13 ones	
−27	= 2 tens 7 ones	= 2 tens 7 ones	
		1 ten 6 ones	= 16

1. Explain the way the subtraction was done. Notice that we took 1 ten and changed it to 10 ones. Then we had 13 ones.

This is a shorter way to write the work:

$$\begin{array}{r} {\scriptstyle 3\ 13} \\ \cancel{4}\cancel{3} \\ -27 \\ \hline 16 \end{array}$$

Write the helping numbers if you need to do so.

When we take from the tens' column to give to the ones' column, we are borrowing from the tens.

2. When do we borrow from the tens in subtraction?

Copy these examples and find the answers:

	a	b	c	d	e	f	g	h
3.	31	32	64	40	54	48	40	82
	−12	−13	−15	−16	−47	−39	−21	−79
4.	56	73	48	97	36	75	68	80
	−27	−34	−19	−39	−18	−46	−29	−67

SUBTRACTING MONEY NUMBERS

Subtract money numbers just as you do other numbers. Copy these examples and write the remainders:

	a	b	c	d	e	f
1.	$9.45	$7.78	$3.89	$4.84	$3.80	$9.43
	−8.23	−.53	−3.66	−1.20	−1.40	−2.43

BORROWING FROM THE HUNDREDS

We can borrow from the hundreds' place just as we borrow from the tens' place.

Study the way this example is worked:

$$\begin{array}{r} 318 \\ -176 \\ \hline \end{array}$$

We borrow 1 hundred from the hundreds' place and change it to 10 tens. Then we have 11 tens.

$$\begin{array}{r} {\scriptstyle 2\ 11} \\ \cancel{3}\cancel{1}8 \\ -176 \\ \hline 142 \end{array}$$

1. Copy these examples and write the remainders:

a	b	c	d	e	f
453	629	143	857	208	736
−292	−295	−72	−762	−184	−471

Sometimes we must borrow from both the tens' and the hundreds' places. Study this example carefully:

427 =	3 hundreds	11 tens	17 ones	
−159 =	1 hundred	5 tens	9 ones	
	2 hundreds	6 tens	8 ones	= 268

This is a shorter way to write the work:

$$\begin{array}{r} {\scriptstyle 3\ 11\ 17} \\ \cancel{4}\cancel{2}\cancel{7} \\ -159 \\ \hline 268 \end{array}$$

Copy these examples and find the answers:

	a	b	c	d	e	f
2.	754	984	356	832	971	582
	−369	−468	−197	−745	−506	−284
3.	995	517	696	732	587	843
	−267	−108	−279	−296	−499	−154

Time for Practice

1. Read these numbers:

a. 2432	c. 3484	e. 7505	g. 7777
b. 1211	d. 8419	f. 6320	h. 9072

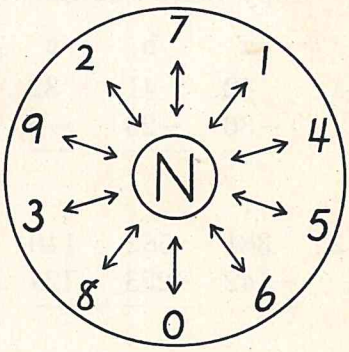
2. Using the numbers that you have just read, write:
   a. the number with the fewest ones.
   b. the number with the most thousands.
   c. the number with the most tens.
   d. the number with the most ones.
   e. the number with the fewest hundreds.
   f. the number with the most hundreds.
   g. the number with the fewest thousands.
   h. the number with the fewest tens.

3. Write these dates in words:

a. 1918	c. 1865	e. 1945	g. 1515	i. 1215
b. 1607	d. 1066	f. 1789	h. 1929	j. 1456

Without Paper and Pencil

Use the number circle to practice adding. Think of a number between 0 and 9. Think of it in the circle where the *N* is.



1. Add this number to each number in the circle.

2. Add each number in the circle to another number that you think of for *N*.

3. Add each of the other numbers between 0 and 9 to the numbers in the circle. See how fast you can add. Have your teacher time you.

SUBTRACTION TEST

(Subtraction without borrowing)

Copy these examples and write the answers:

	a	b	c	d	e	f	g	h
1.	17	18	27	46	29	32	65	87
	−14	−6	−15	−6	−19	−11	−14	−16
2.	55	94	66	77	$.75	$.90	$.89	$.99
	−23	−82	−24	−42	−.30	−.50	−.71	−.45
3.	445	$4.70	676	788	899	549	$9.28	$2.99
	−131	−2.50	−234	−535	−718	−201	−7.10	−1.09

SUBTRACTION TEST

(Subtraction with borrowing)

Copy these examples and write the answers:

	a	b	c	d	e	f	g	h
1.	42	41	32	53	82	30	52	76
	−36	−23	−5	−8	−79	−17	−34	−48
2.	381	582	140	460	723	323	541	510
	−142	−223	−124	−313	−649	−235	−278	−109
3.	242	262	361	$2.61	$4.17	$3.27	$5.21	$3.04
	−18	−53	−7	−1.49	−2.83	−2.94	−2.47	−.18

THINKING ABOUT THIS CHAPTER

1. How many figures are used in our number system? Name them. What is place value?

2. When zero is added to a number, what is the sum?

3. When zero is subtracted from a number, what is the remainder?

4. What are three words that are not numbers but that tell exactly how many? What are three words that tell how many but not exactly how many?

5. Tell the doubles with sums less than 20 and give their sums. Tell the addition facts that have 10 as their sums.

6. Tell the near-doubles with sums less than 18 and give their sums.

HOW MUCH HAVE YOU LEARNED?

(Chapter Test 1)

Copy these examples and find the answers:

	a	b	c	d	e
1.	47 +52	831 +46	468 −35	$5.69 −.65	437 +798
2.	463 −117	259 +851	552 −87	$4.78 +7.05	719 −149

3. a Add: 6, 3, 4, 5

b Add: 8, 7, 4, 9

c 9 + 6 + 7

d 98 − 4

e 56 + 17

f 63 − 17

HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 1)

Work these problems. Show all your work on your paper.

1. Mary walks eight blocks to school and Alice walks three blocks. How many fewer blocks does Alice walk than Mary?

2. John said that he walks nine blocks. How far do Mary, Alice, and John walk all together?

3. Mary and Alice buy their lunches in the school cafeteria. One day they each paid 23¢. What did they pay all together?

4. When Mary paid for her lunch she gave the cashier $.50. How much change should she have received?

5. Alice gave the cashier one dollar. How much change should she have received?

6. John brought his lunch and bought milk for 4¢. How much less did he pay than Alice?

7. John bought new skates, for which he paid $3.40. Harry said his skates cost $.50 less. Tell how much Harry paid.

8. How much did John's skates and Harry's skates cost all together?

9. John gave the clerk a five-dollar bill to pay for his skates. How much change should he have received?

10. Harry bought a new tire for his bicycle. It cost $4.62. He also bought a new light that cost $1.25. How much did these cost all together?

THIS IS DIFFERENT

(Enrichment material)

1. Sometimes we have to find what number has been added to another to get an answer. Copy each of the following examples and write the figure which should go where the question mark (?) is:

7	3	8	12	1?	2?	?6
+?	+?	+?	+?	+2	+7	+?
10	9	8	17	16	28	19

2. Copy these subtraction examples and write the missing figures:

5	14	28	3?	??	??	48
−?	−?	−?	−6	−8	−7	−?
2	7	25	33	6	32	48

3. Write the answers to these questions:

a. To find the missing numbers in Exercise **1**, did you add or subtract?

b. What did you do in Exercise **2?**

c. How did you check your work in each exercise?

4. Copy these examples and write the missing figures. Watch the signs!

??	??	1?	1?	?3	2?	42
+7	−7	−5	+?8	+38	−7	−??
21	7	14	48	51	17	4

5. Add each number in Row **a** to each number in Row **b.**

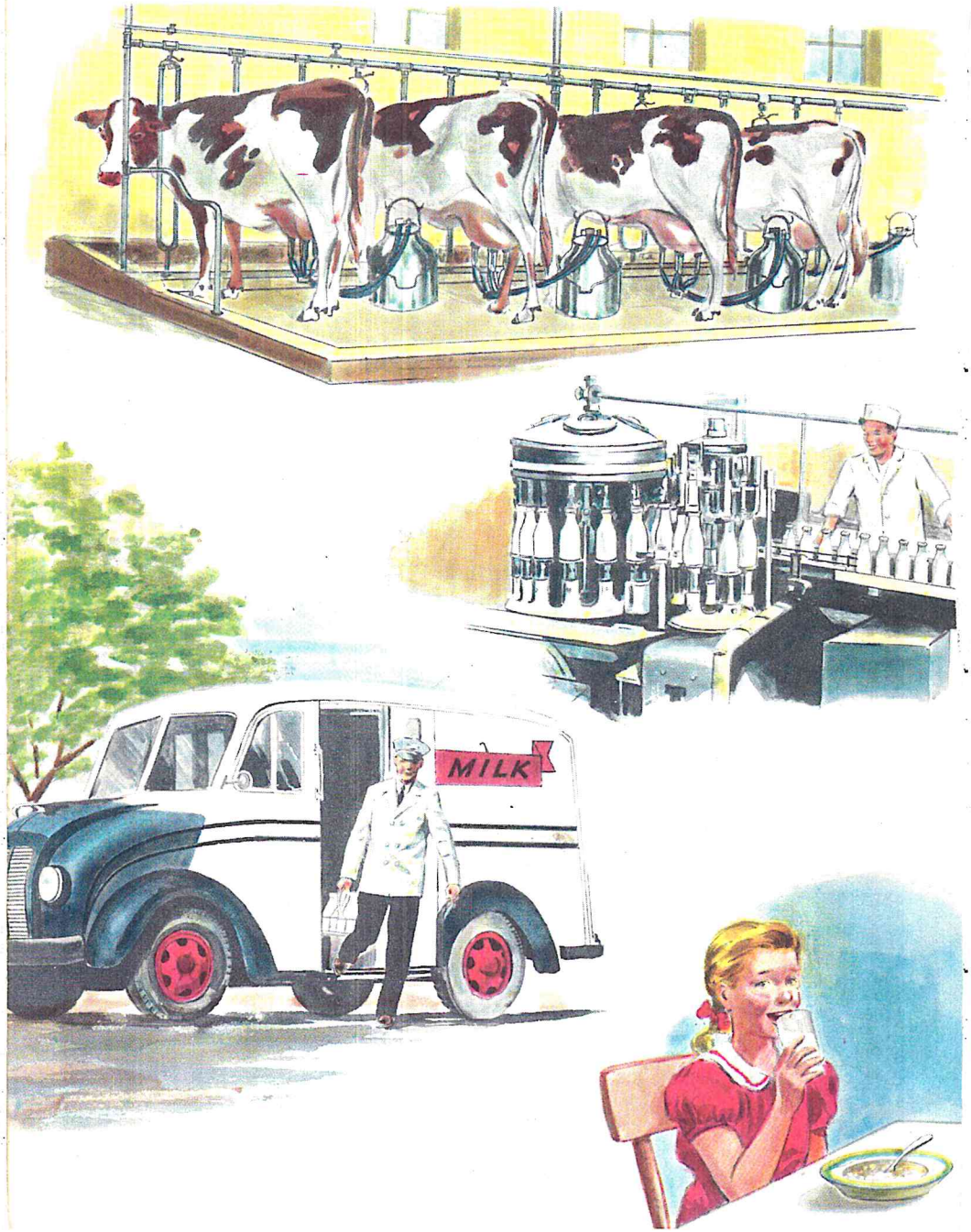
a.	4	7	11	19	23	35	48	56
b.	9	13	18	27	34	46	55	62

6. Subtract each number in Row **a** from each number in Row **b.**

a.	2	5	7	9	11	16	24	38	43
b.	50	63	79	88	90	99	101	439	

CHAPTER II

How to Multiply and Divide



SELLING MILK

Does a delivery man bring milk to your house each morning? He comes to Ruth's home and brings the milk. He also delivers cream, cheese, or butter when Ruth's mother orders it.

These things happen before Ruth drinks her milk for breakfast:

The farmer milks the cows. The milk is delivered to the creamery.

The people at the creamery put part of the milk in quart bottles. They make cheese from some of it. They separate the cream from some of the milk. They sell some cream and make butter from the rest of the cream.

The delivery man leaves milk at the back door of Ruth's house. Ruth's mother pays for it.

1. Tell all the ways you can in which the people who work with milk use arithmetic.

2. Make up five problems about milk. What are the answers?

Work the problems below. Show all your work on your paper.

3. Mr. King is a farmer. He milks his cows morning and night. Each time he gets 60 gallons of milk. How much milk does he get each day?

4. In the creamery 40 bottles are filled each minute. How many bottles are filled in 2 minutes? in 5 minutes?

5. Bottle caps come in boxes that hold 5000. Each morning the creamery uses 4000 caps. How many would this leave in a box that had been full?

6. Ruth's mother paid the milk bill. It was $4.20. She gave the delivery man $5.00. How much change should she have received?

MULTIPLYING IS LIKE ADDING

(Multiplying 2)

Every morning the milkman delivers 2 quarts of milk to Ruth's home. Ruth's mother said, "How many quarts does the milkman leave in a week?"

Ruth thought: "There are 7 days in a week. I must add 2 seven times."

She wrote the work as you see it at the right.

Sunday	2
Monday	2
Tuesday	2
Wednesday	2
Thursday	2
Friday	2
Saturday	2
	14

Then Ruth thought: "There is a shorter way. It is to multiply seven by two. Seven times two equals fourteen. The answer is fourteen quarts of milk."

We can say, "Seven 2's are 14."

We write: **7 × 2 = 14**

Multiplication is like addition. We multiply when all the numbers to be added are the same.

Review these multiplication facts for 2:

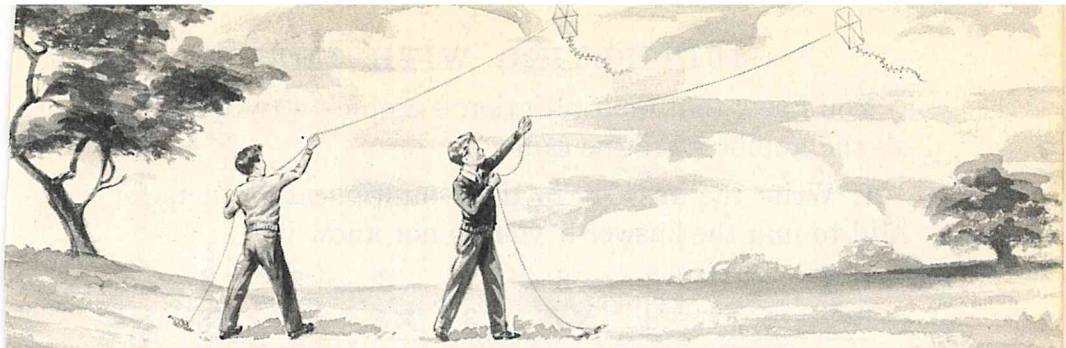
2	2	2	2	2	2	2	2	2
×1	×2	×3	×4	×5	×6	×7	×8	×9
2	4	6	8	10	12	14	16	18

The answer in multiplication is called the product.

6 × 2 = 12 12 is the **product.**

Find the product for each of the following by adding. Write your work this way: 3 × 2 = 2 + 2 + 2 = 6

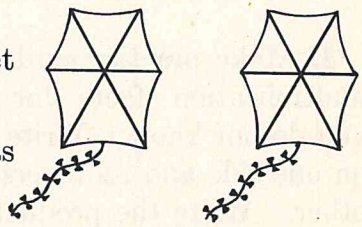
	a	b	c	d
1.	3 × 2	5 × 2	4 × 2	9 × 2
2.	6 × 2	2 × 2	8 × 2	7 × 2



MAKING A THREE-STICK KITE

(Multiplying with 2)

David and Fred asked their father to make each of them a three-stick kite.



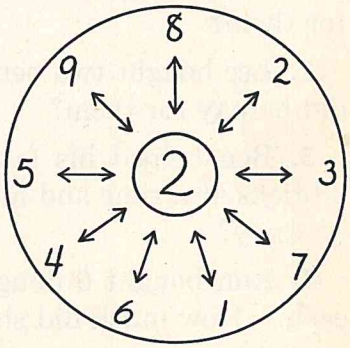
Their father said, "Will you get the sticks for me?"

The boys found six sticks. Was that the right number?

Look at the picture. Count the sticks in the two kites. There are six. We can find the number by adding. $3 + 3 = 6$. We can also multiply. $2 \times 3 = 6$

You have learned the "times 2" facts. Each "times 2" fact has a reverse. 2×3 is the reverse of 3×2. The product for each is 6.

Look at page 34 and write the reverses of the nine "times 2" facts with their products.



Without Paper and Pencil

Start at the top and go round the circle as fast as you can. First multiply each number by 2. Say only the product. Then multiply 2 by each number.

MULTIPLYING WITH THREE

You know that multiplication is a quick way to add when all the numbers are the same.

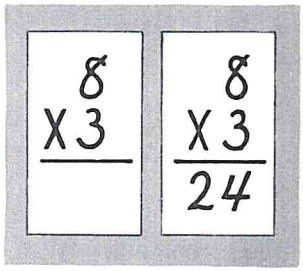
1. Write the answers to these multiplication facts for 3. Add to find the answer if you do not know it.

3	3	3	3	3	3	3	3	3
×2	×4	×1	×7	×3	×5	×9	×8	×6

2. Write the answers to the reverses:

3	1	5	2	4	9	7	6	8
×3	×3	×3	×3	×3	×3	×3	×3	×3

3. Make practice cards for any multiplication facts for 3 that you do not know. Write one fact on one side and its reverse on the other. Write the product on one side only. The front and back of one of your cards will look like this:



MULTIPLICATION PROBLEMS

Work these problems. Show all your work on your paper.

1. Jerry bought five 3¢ stamps. How much did he pay for them?

2. Lee bought two pencils that cost 3¢ each. How much did he pay for them?

3. Ben helped his father build a fireplace. He carried 3 bricks at a time and made 8 trips. How many bricks did he carry?

4. Ann bought 6 doughnuts at the store. They cost 3¢ each. How much did she pay for the doughnuts?

5. Helen's mother said: "I have seven small vases to fill with roses for my party. I will put 3 roses in each vase." How many roses did she need for the vases?

6. Jane helped her mother bake rolls. They filled 9 pans with rolls. Each pan held 3 rolls. How many did they bake?

7. Choose three of the problems that you have just worked and draw pictures to show that your answers are right.

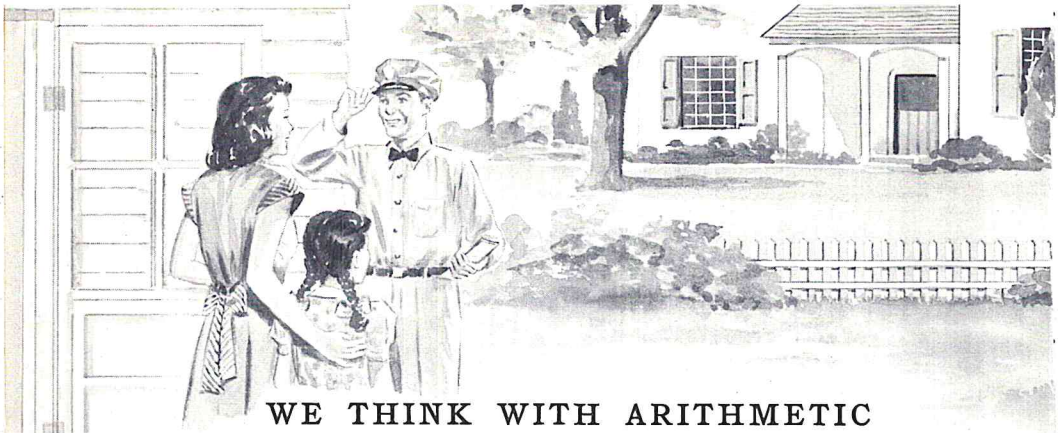
MULTIPLICATION TEST

(Multiplying with 2's and 3's)

Copy these examples and write the products:

	a	b	c	d	e	f	g	h
1.	2	3	3	9	4	2	3	2
	×6	×2	×6	×2	×3	×5	×7	×2
2.	8	7	2	2	3	3	2	6
	×2	×3	×4	×7	×1	×8	×1	×3
3.	1	5	2	3	5	9	2	1
	×3	×3	×8	×9	×2	×3	×3	×2
4.	3	2	3	7	4	3	6	8
	×3	×9	×5	×2	×2	×4	×2	×3

Be sure that you have a practice card for any fact that you did not know.



WE THINK WITH ARITHMETIC

When Ruth found how many quarts of milk the milkman delivered in one week, she solved a problem.

We should not have to be told how to find the answer every time we have a problem to solve. We should be able to solve the problem ourselves. We should be able to decide whether we are to add, subtract, multiply, or divide. Deciding what to do is thinking. Is it hard to think?

When we use arithmetic in our work or play, we have to decide what we must do with the numbers. We have to think.

John has a paper route. He collects 25¢ a week from Mrs. White. One week Mrs. White gave him 50¢. What does John have to decide if he is to give Mrs. White the correct change?

John can add 50¢ and 25¢ or he can subtract 25¢ from 50¢. What would you do?

John knows that he should give Mrs. White less than she gave him. He knows that he will have to take his 25¢ from the 50¢.

The words **less than** and **take from,** which John thinks, tell him to **subtract.** He thinks:

$$\begin{array}{r} 50¢ \\ -25¢ \\ \hline 25¢ \end{array}$$

John knows that he must give Mrs. White 25¢.

MAKING UP PROBLEMS

Make up three problems about your work or play. Write them and show the work you do to find the answers. You can make up problems about playing ball, helping your mother, buying paper for school, or anything else you wish to.

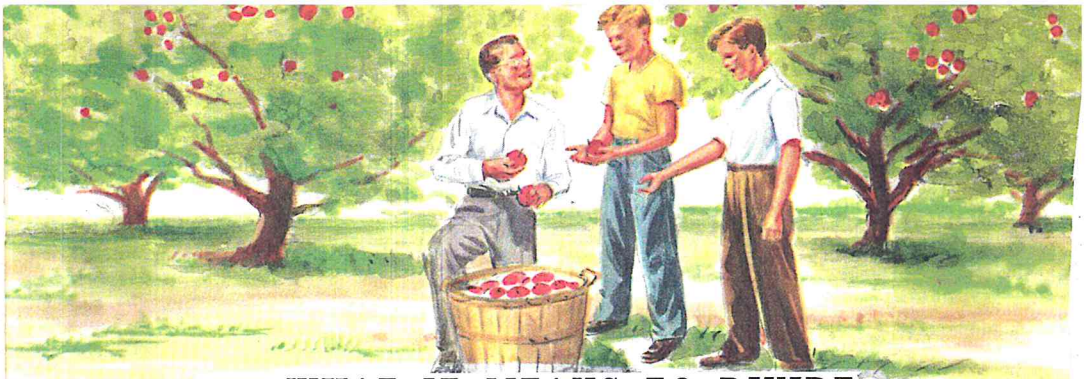
Time for Practice

Copy these examples and find the sums:

	a	b	c	d	e	f
1.	3 8 3 4	8 4 8 5	9 6 4 7	9 7 2 5	7 7 3 7	8 7 3 6
2.	300 +250	145 +32	$5.32 +.56	$1.46 +2.53	$3.00 +4.00	$1.11 +.01
3.	349 +343	135 +87	154 +9	605 +405	124 +276	322 +289

Copy these examples and find the differences:

	a	b	c	d	e	f
4.	24 −12	25 −10	67 −51	99 −63	888 −264	999 −327
5.	362 −200	789 −783	438 −138	256 −214	344 −312	567 −562
6.	$3.32 −2.10	$4.58 −2.00	$5.38 −.05	$4.65 −1.37	$6.82 −2.58	$9.91 −6.54
7.	365 −187	754 −659	191 −92	450 −386	327 −159	973 −689

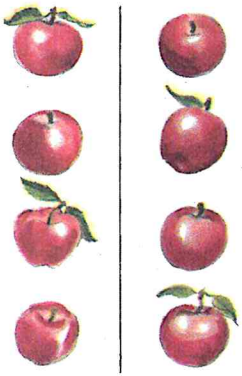


WHAT IT MEANS TO DIVIDE

David and Fred visited Mr. Jones on his farm. Mr. Jones gave the two boys 8 apples. David said, "We should divide them equally."

What does **divide** mean?

When we have a group of things and wish to separate them into smaller equal groups, we divide.



When we divide 8 by 2, we find the number that will be in each of two groups. Study the picture. The line divides the apples into two equal groups. There are 4 apples in each group.

We say, "8 divided by 2 equals 4."

We write: $2\overline{)8}$ (4) or $8 \div 2 = 4$

Draw pictures showing the following things divided by 2:

a. 6 candy canes **c.** 12 marbles **e.** 18 boxes

b. 4 oranges **d.** 16 lines **f.** 10 circles

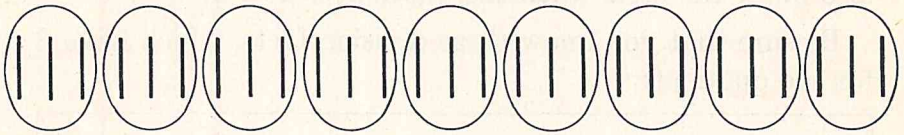
Be sure that you know these division facts for 2:

1	2	3	4	5	6	7	8	9
2)2	2)4	2)6	2)8	2)10	2)12	2)14	2)16	2)18

DIVIDING BY THREE

The pupils in Judy's room divided into groups of 3 pupils each for a contest. There were 27 pupils in the room. The teacher asked Judy how many groups there would be. Can you tell?

This is the way Judy worked the problem: She made 27 marks, one mark for each pupil. Then she drew a circle around the first three marks, the next three, and so on.



Judy counted the groups and found that there were nine.

We can write the work this way: $\begin{array}{r} 9 \\ 3\overline{)27} \end{array}$ or **27 ÷ 3 = 9**

The answer, or **quotient,** is 9.

The answer in division is called the quotient.

Harry, another pupil in the room, said: "We divided to find how many there would be in a group. We divided 8 apples into two groups and found 4 in each group.

"Now we have divided to find how many groups. If there are 27 pupils and 3 pupils in each group, there will be 9 groups."

When we divide, we find how many there are in a group or how many equal groups there are.

Draw pictures as Judy did to find the quotients:

	a	b	c	d
1.	3 ÷ 3	24 ÷ 3	6 ÷ 3	15 ÷ 3
2.	9 ÷ 3	21 ÷ 3	12 ÷ 3	18 ÷ 3

DIVISION FACTS WITH QUOTIENTS OF TWO AND THREE

You found that each multiplication fact has its reverse. You learned that $3 \times 7 = 21$ and that $7 \times 3 = 21$.

The division facts do not have reverses. But each division fact does have a related division fact.

Read this fact: $21 \div 3 = 7$

This is the related fact: $21 \div 7 = 3$

You learned the facts for division by 2 and 3. You should also know the facts when the quotient is 2 or 3.

Be sure that you know these division facts, which have 2 for the quotient:

$\overline{3)6}$ 2	$\overline{2)4}$ 2	$\overline{4)8}$ 2	$\overline{6)12}$ 2	$\overline{9)18}$ 2	$\overline{7)14}$ 2	$\overline{5)10}$ 2	$\overline{1)2}$ 2	$\overline{8)16}$ 2

Be sure that you know these division facts, which have 3 for the quotient:

$\overline{4)12}$ 3	$\overline{1)3}$ 3	$\overline{3)9}$ 3	$\overline{5)15}$ 3	$\overline{2)6}$ 3	$\overline{9)27}$ 3	$\overline{7)21}$ 3	$\overline{6)18}$ 3	$\overline{8)24}$ 3

Copy these examples and write the quotients:

	a	b	c	d	e	f
1.	$\overline{2)6}$	$\overline{3)9}$	$\overline{2)16}$	$\overline{2)2}$	$\overline{3)18}$	$\overline{3)21}$
2.	$\overline{2)8}$	$\overline{3)27}$	$\overline{3)24}$	$\overline{3)12}$	$\overline{2)18}$	$\overline{2)12}$
3.	$\overline{3)3}$	$\overline{2)4}$	$\overline{3)6}$	$\overline{2)10}$	$\overline{3)15}$	$\overline{2)14}$

Write the products:

4. Multiply by 2:	3	9	6	5	8
5. Multiply by 3:	8	6	9	4	7

DIVISION TEST

(Division facts with 2 and 3)

Copy these examples and write the quotients:

	a	b	c	d	e	f
1.	$3\overline{)9}$	$2\overline{)4}$	$3\overline{)15}$	$8\overline{)16}$	$2\overline{)8}$	$3\overline{)6}$
2.	$2\overline{)6}$	$3\overline{)12}$	$2\overline{)2}$	$4\overline{)12}$	$2\overline{)12}$	$5\overline{)15}$
3.	$3\overline{)3}$	$5\overline{)10}$	$4\overline{)8}$	$2\overline{)16}$	$3\overline{)18}$	$6\overline{)12}$
4.	$2\overline{)10}$	$6\overline{)18}$	$2\overline{)18}$	$3\overline{)21}$	$2\overline{)14}$	$8\overline{)24}$
5.	$7\overline{)21}$	$9\overline{)18}$	$7\overline{)14}$	$3\overline{)24}$	$3\overline{)27}$	$9\overline{)27}$

DIVISION PROBLEMS

Work these problems. Show all your work on your paper.

1. Fourteen children were at Ida's birthday party. They divided into two equal groups to play ball. How many children were there in each group?

2. Nine of those who were at Ida's party were girls. They divided into three equal groups for a singing contest. How many were there in each group?

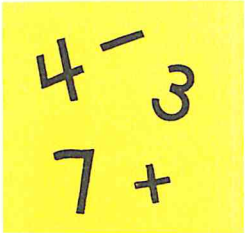
3. Hans had fifteen marbles to give to his younger brothers. Each brother got five. Tell how many brothers Hans had.

4. James had twenty-one rabbits to put in three pens. How many rabbits did he put in each pen if he put the same number in each pen?

5. Ann picked twelve roses. She put them in vases with three roses in each vase. How many vases did she use?

6. In each of the five problems that you have just worked tell whether you found out how many in a group or how many groups.

MULTIPLICATION AND DIVISION FAMILIES



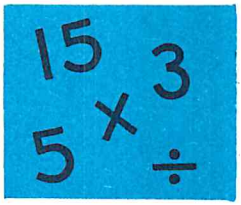
Do you remember the addition and subtraction families? This is the addition and subtraction family for 4, 3, and 7:

$4+3=7 \quad 3+4=7 \quad 7-4=3 \quad 7-3=4$

Write the addition and subtraction families for these numbers:

a. 5, 3, 8	**c.** 7, 7, 0	**e.** 15, 8, 7	**g.** 9, 7, 16
b. 6, 2, 8	**d.** 9, 2, 7	**f.** 7, 12, 5	**h.** 13, 7, 6

The multiplication and division facts have families. This is the multiplication and division family for 3, 5, and 15:



$3 \times 5 = 15 \qquad 5 \times 3 = 15$

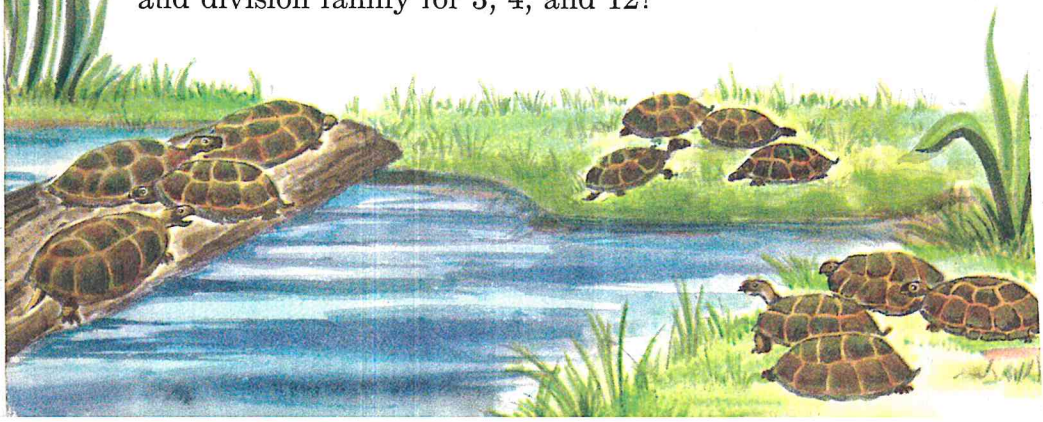
$15 \div 3 = 5 \qquad 15 \div 5 = 3$

When we know one part of a number family, we can figure out the other parts.

You know how to finish each fact below. Write the complete fact and the other facts in its family.

	a	b	c	d
1.	2×3	2×7	2×8	7×3
2.	3×4	3×6	3×9	6×2
3.	3×5	9×2	8×3	2×1

4. How does the picture below show the multiplication and division family for 3, 4, and 12?



MULTIPLYING WITH ZERO

It is interesting to study zero. Zero means **none** or **not any,** but it is very important.

0
This is zero.
It means none,
or not any.

1. Look at this number: **405.** What does the zero in it mean?

2. Tell what zero in each of these numbers means:

104 230 500 1043 1001

3. In these numbers we say zero is a **place holder.** Explain what we mean by a place holder.

Do you remember these facts about zero?

When we add zero to a number, the sum is that number.

When we subtract zero from a number, the remainder is that number.

What happens when we multiply zero by a number? a number by zero?

To multiply is to add.

3×0 means to add 3 zeros. If we add nothing, we get nothing!

$$\begin{array}{r} 0 \\ 0 \\ 0 \\ \hline 0 \end{array}$$

$$3 \times 0 = 0 \qquad 0 \times 3 = 0$$

When we multiply a number by zero or zero by a number, the product is zero.

Be sure that you know these facts. Then write the reverses with their answers.

0	0	0	0	0	0	0	0	0
×1	×2	×3	×4	×5	×6	×7	×8	×9
0	0	0	0	0	0	0	0	0

MULTIPLYING TWO-PLACE NUMBERS BY TWO AND THREE

(No carrying)

Beth worked 23 arithmetic examples on Monday, 23 on Wednesday, and 23 on Friday. How many did she work in the 3 days?

Although we can add to find the answer, it is shorter to multiply. There are 2 tens and 3 ones in 23. We multiply the 3 ones by 3. Then we multiply the 2 tens by 3.

23 =	2 tens	3 ones		23
×3	×3	×3		×3
	6 tens	9 ones	= 69	69

Beth worked 69 arithmetic examples in the 3 days.

1. Multiply each of these numbers by 2:

13 24 42 51 33 34

2. Multiply each of these numbers by 3:

12 31 22 43 62 71

It is easy to multiply a two-place number with zero in the ones' place. Study the examples at the right.

40	60
×2	×3
80	180

When there is a zero in the ones' place of the number multiplied we always write zero in the ones' place of the product.

3. Copy these examples and write the products:

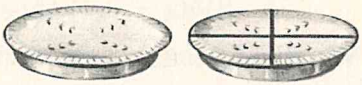
a	b	c	d	e	f	g
40	20	30	70	60	50	10
×3	×3	×2	×2	×3	×2	×3

DIVIDING A WHOLE OBJECT

Look at the pictures. Each picture shows all of something and also the same thing in smaller, equal parts.

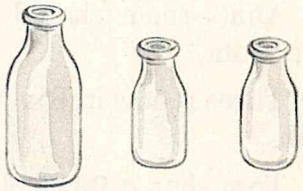
One apple is cut into 2 equal parts. Each part is $\frac{1}{2}$.

One pie is cut into 4 equal parts. Each part is $\frac{1}{4}$.



A glass of milk has been poured into 2 glasses. There is the same amount of milk in each glass. Each of these contains $\frac{1}{2}$ of a glass of milk.

A quart of milk can be put into 2 pint bottles. Each pint is $\frac{1}{2}$ of a quart.



A candy bar has been broken into 3 equal parts. Each part is $\frac{1}{3}$.

When a whole object is broken or divided into equal parts, we call these smaller parts fractions of the whole.

Answer, "Yes," or, "No." Then explain your answer.

1. Can one half of something be larger than the other half of the same thing?

2. Can one half of one thing be smaller than one fourth of something else?

3. Is one third of something more than one fourth of the same thing? more than one half of the same thing?

DIVIDING TWO- AND THREE-PLACE NUMBERS

(No borrowing)

Robert said: "I have 46 marbles. Jimmy has none. I will divide them equally between us." This is the way Robert found out how to divide his marbles:

	2 tens 3 ones = 23	**23**
2)46 =	2)4 tens 6 ones	**2)46**

We divide tens as we divide ones.

Tell how much each will get when the following things are shared equally:

1. Jack shared 28 blocks with Fred.

2. Sue shared 36 pansies with Alice and Mary.

3. Ann's room shared 80 sheets of colored paper with Joy's room.

4. Three rooms in Riverview School shared 63 new library books.

5. Tom shared 90 airplane stamps with Harry and John.

Study this example:

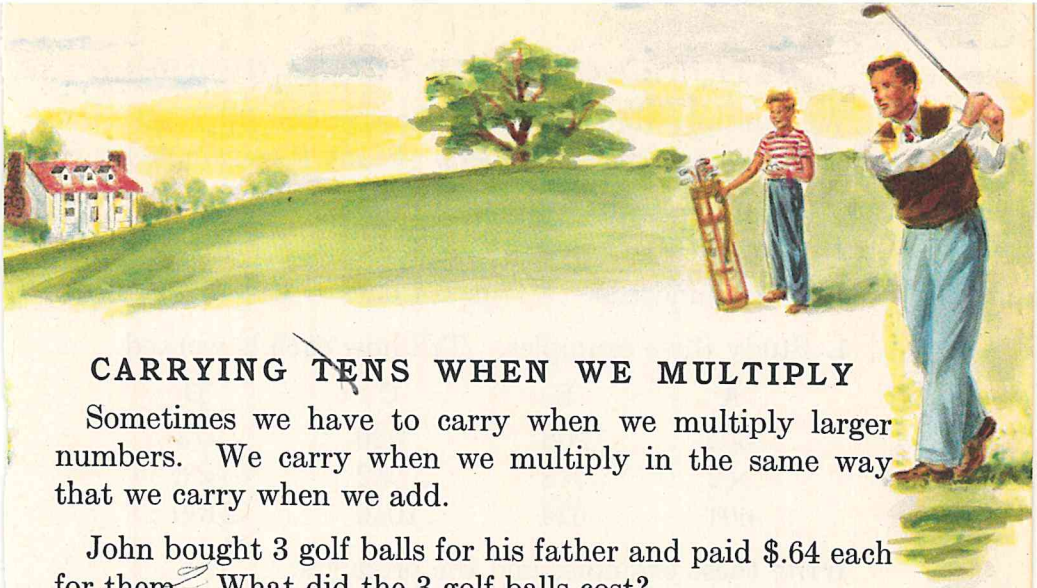
	1 dollar 2 dimes 3 pennies = $1.23	
3)$3.69 =	3)3 dollars 6 dimes 9 pennies	**$1.23**
		3)$3.69

We divide hundreds as we divide tens and ones.

We divide money numbers as we divide other numbers.

Copy these examples and find the quotients:

	a	b	c	d	e
6. Divide by 2:	22	64	48	242	468
7. Divide by 3:	63	93	66	363	936
8. Divide by 2:	$.42	$2.42	$8.84	$6.48	$4.48
9. Divide by 3:	$.39	$3.36	$9.63	$6.99	$9.96



CARRYING TENS WHEN WE MULTIPLY

Sometimes we have to carry when we multiply larger numbers. We carry when we multiply in the same way that we carry when we add.

John bought 3 golf balls for his father and paid $.64 each for them. What did the 3 golf balls cost?

$.64 =	6 dimes	4 pennies	
×3	×3	×3	
	18 dimes	12 pennies = $1.92	

$ .64
×3
$1.92

Study the examples at the right. In Example **A** what does the 14 mean? What does the 60 mean? Where did we get 60? Where did we get 74? Show that we can add 37 + 37 and get 74. Why is it easier to write the work as it is in Example **B**?

A	B
37	37
×2	×2
14	74
60	
74	

1. Multiply each number below by 2 and add 1 to the product. Say only the answer.

4 6 0 8 5 3 7 2 9

2. Multiply each number above by 3 and add 1 to the product. Say only the answer.

Write the examples and the products:

3. 2 ×	16	27	46	38	59
4. 3 ×	15	34	46	20	65

MULTIPLYING THREE-PLACE NUMBERS

We multiply three-place numbers in the same way that we multiply two-place numbers. Study the example below:

342 =	3 hundreds	4 tens	2 ones		**342**
×2	×2	×2	×2		**×2**
	6 hundreds	8 tens	4 ones	= 684	**684**

1. Study these examples. Tell how each is worked.

A	**B**	**C**	**D**
302	208	520	713
×2	×3	×2	×3
604	624	1040	2139

Write these examples and the products:

2. 2 ×	124	231	403	514
3. 3 ×	121	230	313	412

SHALL WE ADD OR MULTIPLY?

When we wish to put unequal numbers together to get a larger number, we add.

Example: The milkman delivered milk to four houses in one block. At the first house he left 3 quarts, at the second 6 quarts, at the third 5 quarts, at the fourth 1 quart. How many quarts did he leave in all?

Answer: We add. $3 + 6 + 5 + 1 = 15$. He left 15 quarts.

When we wish to put together the same number two or more times, we multiply.

Example: The milkman delivered 5 quarts of milk to each of 3 houses in another block. How many quarts did he leave at the 3 houses together?

Answer: We multiply. $3 \times 5 = 15$. He left 15 quarts.

THE MILKMAN DELIVERS THE MILK

(Addition and multiplication problems)

Would you like to go with the milkman today? He may ask you to help him with his arithmetic. Before you work his problems you will have to decide whether to add or multiply.

1. At his first stop the milkman left a quart of milk which cost 19¢ and a pound of butter which cost 70¢. How much did the two things cost?

2. At his second stop he left two quarts of milk. How much did the milk cost?

3. At his third stop he left 3 pounds of butter. How much did the butter cost?

4. The milkman drove to three stores. The first store was 8 blocks from where he started, the next 5 blocks farther on, and the third 9 blocks still farther on. How far did he drive going to the stores?

5. At forty stops the milkman left two quarts of milk at each stop. How much milk did he leave at all these stops?

6. At eighty-three stops the milkman left three quarts of milk at each stop. How much milk did he leave at all these stops?

7. Each day the milkman drove his truck 23 miles. How far did he drive it in two days? in three days?

Time for Practice

Copy these examples and write the products:

	a	b	c	d	e	f
1.	18	$.24	75	$.60	69	$.48
	×2	×3	×3	×2	×2	×3
2.	111	504	$1.14	$1.33	606	513
	×3	×2	×2	×3	×2	×3

THINKING ABOUT THIS CHAPTER

Work these examples by adding. Show all your work on your paper.

	a	b	c	d	e
1.	2×3	3×4	2×7	3×5	9×3
2.	6×2	3×2	7×3	8×2	3×8

Write the multiplication and division families for the numbers below:

	a	b	c	d	e
3.	3, 4, 12	3, 8, 24	10, 5, 2	15, 3, 5	14, 7, 2
4.	6, 2, 12	18, 9, 2	3, 7, 21	16, 2, 8	27, 9, 3

Copy these facts and fill in the blanks:

	a	b	c
5.	$2 \times 3 = 3 + ?$	$3 \times 7 = 7 \times ?$	$14 \div 2 = 14 - ?$
6.	$3 \times 4 = 4 \times ?$	$12 - 6 = 12 \div ?$	$9 + 9 = 2 \times ?$

HOW MUCH HAVE YOU LEARNED?

(Chapter Test 2)

Copy these examples and write the answers:

	a	b	c	d
1.	2×5	4×3	$8 \div 2$	$6 \div 3$
2.	6×2	3×9	$14 \div 2$	$18 \div 3$
3.	9×2	3×7	$18 \div 2$	$27 \div 3$
4.	2×8	8×3	$12 \div 2$	$24 \div 3$
5.	$\begin{array}{r} 13 \\ \underline{\times 3} \end{array}$	$\begin{array}{r} 12 \\ \underline{\times 2} \end{array}$	$\begin{array}{r} 33 \\ \underline{\times 2} \end{array}$	$\begin{array}{r} 41 \\ \underline{\times 2} \end{array}$
6.	$\begin{array}{r} 18 \\ \underline{\times 2} \end{array}$	$\begin{array}{r} 32 \\ \underline{\times 3} \end{array}$	$\begin{array}{r} 18 \\ \underline{\times 3} \end{array}$	$\begin{array}{r} 46 \\ \underline{\times 2} \end{array}$

	a	b	c	d
7.	40	71	$.56	$.96
	×3	×3	×3	×2
8.	2)42	3)96	2)88	2)246
9.	3)$.90	2)$8.60	3)$9.33	3)$6.96

10. What is the name of the answer to a multiplication example?

11. What is the name of the answer to a division example?

IMPROVE YOUR SKILLS

(Diagnostic Test 1)

Work each set of examples. If you miss more than one example in any set, you need to review. The number printed in heavier figures after the set tells you which page to review.

	a	b	c			d	e	f	
1.	11	29	48	**(13)**	2.	18	49	34	**(15)**
	+8	+6	+7			+36	+27	+47	
3.	135	274	689	**(17)**	4.	5	6	7	**(14)**
	+476	+592	+86			8	3	4	
						7	9	5	
5.	17	48	87	**(23)**	6.	684	$4.86	$5.00	**(23)**
	−6	−21	−34			−322	−2.40	−2.00	
7.	56	43	87	**(25)**	8.	685	724	458	**(26)**
	−29	−17	−49			−196	−285	−309	

HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 2)

Work these problems. Show all your work on your paper.

1. Seventeen girls and thirteen boys came to Catherine's birthday party. How many children all together came to the party?

2. Susan and five of her friends had a tea party. There were 18 cookies on the cookie plate. How many cookies were there for each child?

3. Kenneth went to the store with $.50. He bought a toy car for $.37. How much money did he have then?

4. Tom put 16 marbles in two equal groups. How many marbles were there in each group?

5. Dick paid $4.00 for a new bicycle tire and $1.37 for a new horn. How much did the tire and horn cost?

6. Mary arranged the flowers for her mother's party. She had 27 asters to put in three vases. If she put an equal number of asters in each vase, how many asters were there in each vase?

7. Fifteen boys divided into groups of 3 each for a treasure hunt. How many groups were there?

8. Harry bought three prize rabbits. They cost $6.15 each. How much did he pay for the three rabbits?

9. John went to the fair, which lasted 3 days. He had $3.30 to spend. How much could he spend each day if he divided his money equally?

10. Alfred earned $2.20 each day for 3 days. How much did he earn in all 3 days?

11. Dick had a garden. He earned $3 selling potatoes, $5 selling corn, and $8 selling tomatoes. How much did he earn in all?

DO YOU LEARN AND REMEMBER?

(Progress Test 1)

Copy these examples and write the answers:

	a	b	c	d
1.	4 8 3 2	6 7 2 3	4 7 9 4	9 9 8
2.	18 +9	130 +300	$2.00 +6.00	79 +87
3.	322 +289	21 −11	99 −27	979 −437
4.	$6.50 −4.00	113 −104	$3.29 −.45	$4.21 −2.56
5.	43 ×2	33 ×3	241 ×2	302 ×3
6.	2)62	3)96	2)242	3)663

NUMBERS ARE FUN

(Enrichment material)

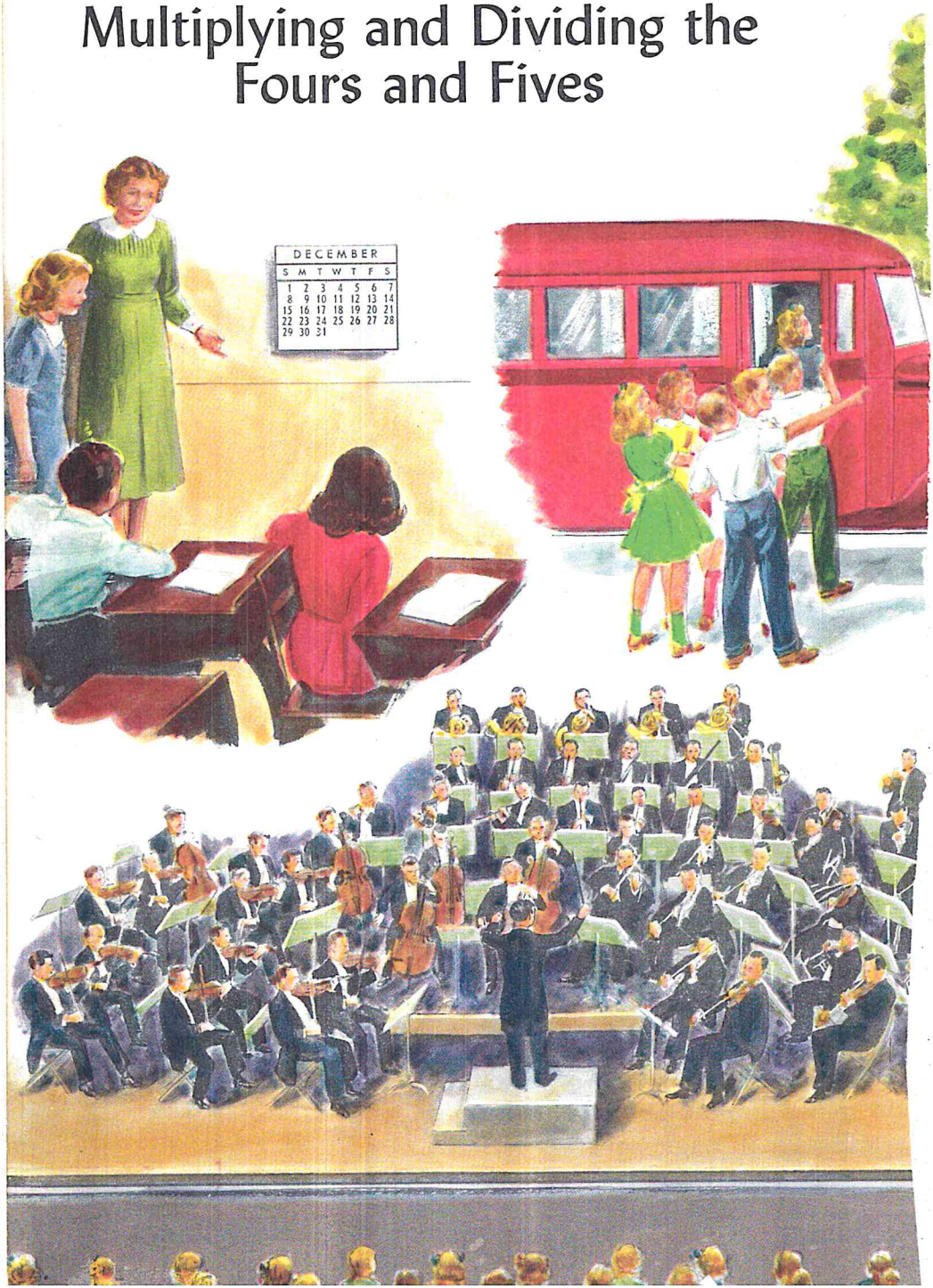
1. Is this a magic square? Add the three numbers in each column and in each row. Add them from corner to corner. Are all the sums the same? If they are, the square is a magic square.

2	9	4
7	5	3
6	1	8

2. See if you can make a magic square of your own. Hint: If you add 3 to each number in the square at the right, will you still have a magic square?

CHAPTER III

Multiplying and Dividing the Fours and Fives



GOING TO A CONCERT

Miss Crane and the pupils in her class planned to go to the concert. Do you know what a concert is? Do you ever listen to a concert on the radio?

1. Sarah asked, "On what day is the concert?"

Miss Crane said: "On December tenth. Today is December third. Can you find the date of the concert on the calendar?" What day of the week is it?

Look at the calendar on page 56 and answer these questions that Miss Crane asked:

2. How many days is it from December third to December tenth?

3. How many days before Christmas is December tenth?

4. The pupils went to the concert in a bus. There were 42 pupils. They lined up in two lines. How many children were there in each line?

5. The pupils paid 4¢ each to ride on the bus. How much did the bus trip cost all the pupils?

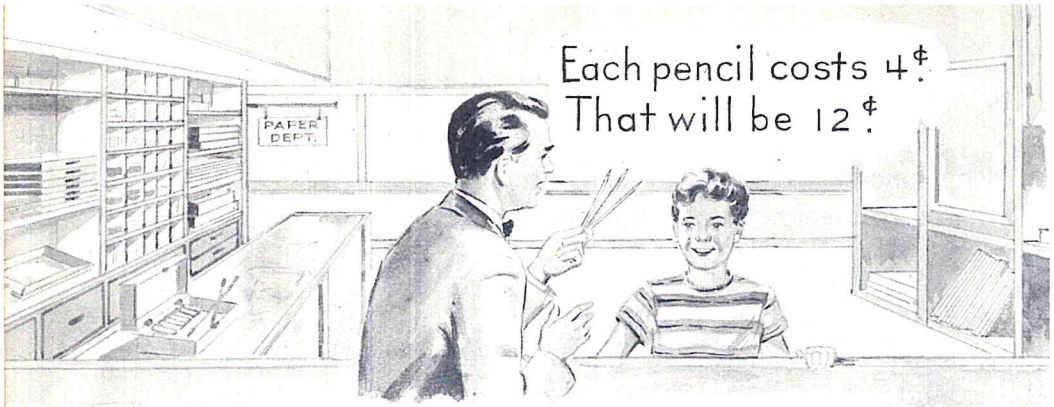
6. After the concert a committee talked to the manager. They found that the hall would hold 2460 people. Write this number in words.

7. All the seats were filled at the concert except 27. How many people attended?

8. In one year about eighty thousand people attended concerts in this hall. Write this number in figures.

9. Eighty men played at the concert. How many more would be needed to have 100?

★ **10.** Make up five problems about going to a concert. Work them and show your work on your paper.



MULTIPLYING FOUR

Look at the picture. David bought 3 pencils. They cost 4¢ each. He must pay 12¢. Find the answer by adding.

We can write the work as a multiplication example this way:

$$3 \times 4 = 12$$

We may say, "Three 4's are 12." This means the same as $4 + 4 + 4 = 12$.

Multiplication is a quick way to add when all the numbers are the same.

Add the 4's below. Then give the products for the multiplication facts with 4.

	4	4	4	4	4	4	4	4
	4	4	4	4	4	4	4	4
		4	4	4	4	4	4	4
			4	4	4	4	4	4
				4	4	4	4	4
$2 \times 4 = ?$					4	4	4	4
$3 \times 4 = ?$						4	4	4
$4 \times 4 = ?$							4	4
$5 \times 4 = ?$								4
$6 \times 4 = ?$		$8 \times 4 = ?$						
$7 \times 4 = ?$		$9 \times 4 = ?$						

Study each multiplication fact in the box below. Say each fact. Begin: "One 4 is 4. Two 4's are 8." Practice until you know all the facts.

4	4	4	4	4	4	4	4	4
×1	×2	×3	×4	×5	×6	×7	×8	×9
4	8	12	16	20	24	28	32	36

The products for multiplying 4 can be found in the following ways:

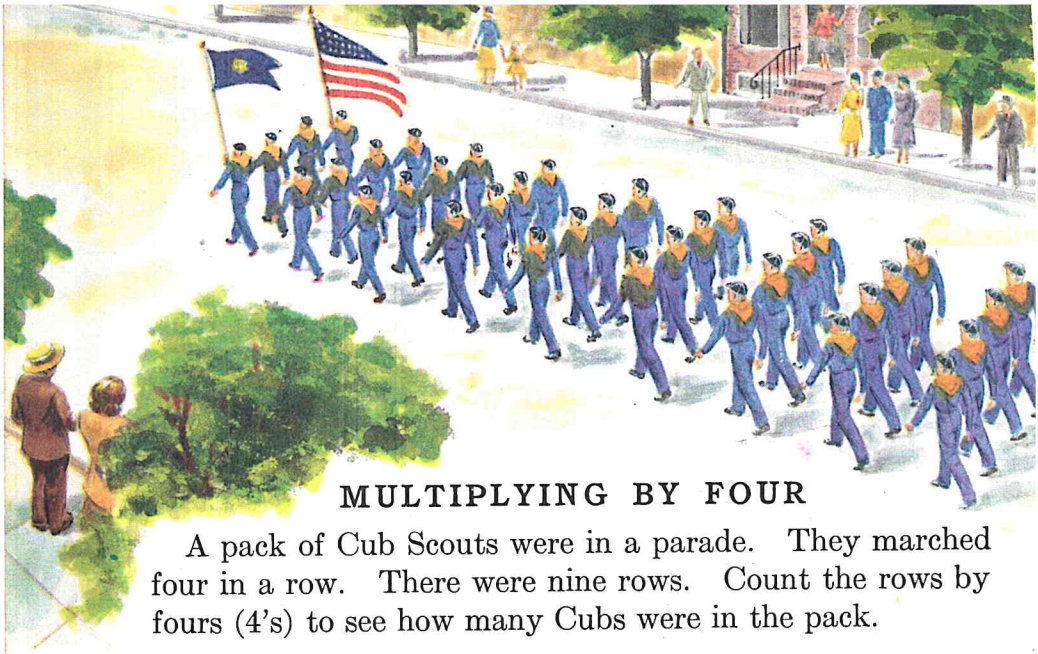
By counting by 4 By adding the 4's By multiplying

The answer when we multiply is called the product.

$3 \times 4 = 12$ 12 is the **product.**

Pretend that you are shopping at the store. Write how much you will pay if you buy:

1. two tablets at 4¢ each.
2. three erasers at 2¢ each.
3. six apples at 4¢ each.
4. eight post cards at 2¢ each.
5. seven marbles at 2¢ each.
6. eight doughnuts at 4¢ each.
7. four cookies at 3¢ each.
8. five candy sticks at 4¢ each.
9. nine lollypops at 4¢ each.
10. seven sheets of colored paper at 4¢ each.
11. three pencils at 3¢ each.
12. three stamps at 6¢ each.



MULTIPLYING BY FOUR

A pack of Cub Scouts were in a parade. They marched four in a row. There were nine rows. Count the rows by fours (4's) to see how many Cubs were in the pack.

$4 \times 9 = 36$ Four 9's are 36.

How many are 4 times each of these numbers? You can find out by counting by 4's, or you can find out by adding.

2 4 7 9 3 1 5 6 8

You remember that each multiplication fact has a reverse. What is the reverse of 9×4?

4×9 is the reverse of 9×4. $9 \times 4 = 36$ $4 \times 9 = 36$

The "4 times" are easy because they are the reverses of the "times 4's."

1	2	3	4	5	6	7	8	9
×4	×4	×4	×4	×4	×4	×4	×4	×4
4	8	12	16	20	24	28	32	36

Make a practice card for each "times 4" and "4 times" fact. Practice until you know all the facts.

Time for Practice

Copy these examples and write the sums:

	a	b	c	d	e	f
1.	3 8 2	5 7 6	4 5 9	8 2 7 6	9 8 5 3	6 7 8 4
2.	14 27	62 70	56 48	42 79	25 35	98 59
3.	246 395	$8.40 6.97	483 570	$4.73 7.62	959 437	$6.48 7.48

Copy these examples and write the remainders:

	a	b	c	d	e	f
4.	837 614	848 159	$6.06 1.24	492 283	764 357	$5.59 4.06
5.	$3.55 1.18	883 284	525 292	$9.07 8.99	792 615	$4.66 3.87
6.	764 82	$5.19 .37	671 328	325 107	748 58	$3.91 .83

Write the answers to the following examples without copying the examples on your paper.

7. Add 8 to each of these numbers:

8 10 14 26 37 49 63

8. Add 7 to each of the numbers above.

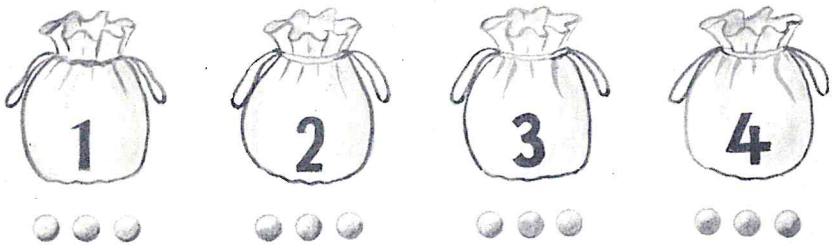
9. Add 9 to each of the numbers above.

10. Add 6 to each of the numbers above.

DIVIDING BY FOUR

Jim had 12 marbles. He wanted to put an equal number in each of 4 bags. Can you tell how many he should put in each bag?

Jim put one marble in front of each bag. Then he put another marble in front of each bag. When he had used all 12 marbles, he had 3 for each bag.



Jim said: "When 12 marbles are used to put an equal number of marbles in 4 bags, there are 3 marbles in each bag."

We write the fact this way:

$$\begin{array}{r} 3 \\ 4\overline{)12} \end{array} \quad \text{or} \quad 12 \div 4 = 3$$

We read the fact, "Twelve divided by four equals three." In this example 3 is the quotient.

Count by 4's until you reach 36. How many 4's did you count to make 4? 8? 12? 16? 20? 24? 28? 32? 36?

$\begin{array}{r} 1 \\ 4\overline{)4} \end{array}$	$\begin{array}{r} 2 \\ 4\overline{)8} \end{array}$	$\begin{array}{r} 3 \\ 4\overline{)12} \end{array}$	$\begin{array}{r} 4 \\ 4\overline{)16} \end{array}$	$\begin{array}{r} 5 \\ 4\overline{)20} \end{array}$	$\begin{array}{r} 6 \\ 4\overline{)24} \end{array}$	$\begin{array}{r} 7 \\ 4\overline{)28} \end{array}$	$\begin{array}{r} 8 \\ 4\overline{)32} \end{array}$	$\begin{array}{r} 9 \\ 4\overline{)36} \end{array}$

Make practice cards for each of the division facts in the box. Practice until you know all of them.

MORE MULTIPLICATION AND DIVISION FAMILIES

Tell how the picture on page 62 shows each of these facts:

$12 \div 4 = 3$ $\quad 12 \div 3 = 4$ $\quad 4 \times 3 = 12$ $\quad 3 \times 4 = 12$

What multiplication and division family is this?

Draw pictures to show the two number families below. Draw diamonds, squares, circles, tops, or anything else.

	a	b	c	d
1.	$24 \div 4 = 6$	$24 \div 6 = 4$	$4 \times 6 = 24$	$6 \times 4 = 24$
2.	$20 \div 4 = 5$	$20 \div 5 = 4$	$4 \times 5 = 20$	$5 \times 4 = 20$

3. Write all the other sets of number facts for the multiplication and division families with 4.

THE CALENDAR

We keep track of the days of the week and the month by using the calendar. See if you can find the story of the calendar in other books.

Study the calendar in your classroom.

1. How many days are there in each month?

2. Does every month have the same number of days every year?

3. What day does each week begin with?

4. How many weeks are there in each month?

5. Does each month have some days left over from the weeks?

6. What is the date two weeks after January 7?

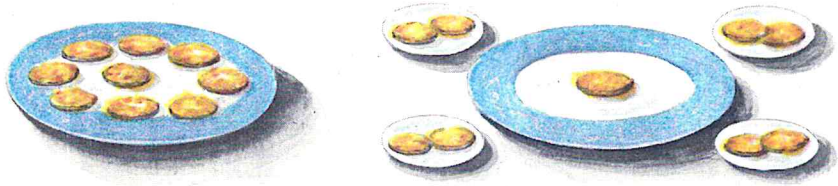
7. What is the date ten days after June 4?

8. Find the day of the week on which these holidays come this year: Christmas, Fourth of July, Labor Day.

9. What holidays are always on the same date each year? What holidays are not always on the same date?

UNEVEN DIVISION BY FOUR

Betty and three friends had a tea party. Betty's mother put 9 cookies on a plate. Betty passed the cookies and told each girl to take two. There was one cookie left over. Betty said, "Nine divided by 4 is 2 with 1 left over."



We may write the work this way:

$$\begin{array}{r} 2 \\ 4\overline{)9} \\ \underline{8} \\ 1 \end{array} \qquad \text{or} \qquad 9 \div 4 = 2 \text{ and } 1 \text{ over}$$

How do we know that $9 \div 4 = 2$ and 1 over? We know that $8 \div 4 = 2$. Then $9 \div 4 = 2$ and 1 more because 9 is 1 more than 8.

The quotient for $9 \div 4$ is 2 with a remainder of 1.

The number left over in division is called a <u>remainder</u>.

We call division with a remainder <u>uneven</u> division.

1. Write each of the numbers in the row below that can be divided by 4 without a remainder. Divide by 4 and write the quotient.

10 11 17 14 16 19 15 8 13 6 12 18

2. Write each of the numbers in the row that cannot be divided by 4 unless there is a remainder. After each of these numbers place the next smaller number that can be divided by 4 without a remainder.

3. Now divide each number in the row above by 4 and write the quotient and remainder. The work for the first example may be written this way: $10 \div 4 = 2$ and 2 over.

4. Which of these numbers can we divide by 4 without having a number left over?

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39

The numbers that we can divide evenly by 4 are printed in red. These numbers help us when we divide the other numbers by 4. We shall call these numbers the **helpers.**

When we divide 21 by 4 we think: "20 is the next smaller number that we can divide evenly by 4. $20 \div 4 = 5$ and $21 - 20 = 1$. The answer to $21 \div 4$ is 5 and 1 over."

When we cannot divide a number evenly, we find the next smaller number that we can divide evenly.

5. Tell which number is the helper when we divide these numbers by 4.

7 13 22 30 25 34 29 21

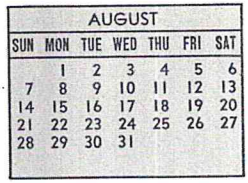
The helper is the next smaller number which will let us divide evenly.

6. Divide each of the numbers at the top of the page by 4.

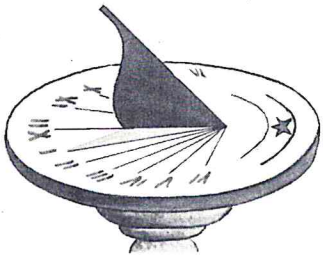
7. Which numbers at the top of the page have a number left over when we divide by 4?

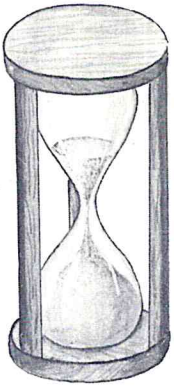
8. What is the largest number which is left over when we divide by 4?

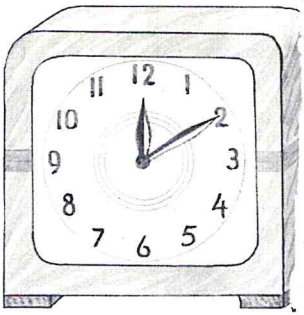
9. Is this largest number left over larger or smaller than 4? How much larger or smaller is it?



AUGUST						
SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			







LEARNING ABOUT TIME

Do you know this rhyme? It will help you to remember how many days there are in each month. If you do not know it, learn it now.

Thirty days hath September,
April, June, and November.
All the rest have thirty-one
Excepting February alone,
Which has but twenty-eight in fine
Till leap year gives it twenty-nine.

1. Write the names of the months in order and write after each name the number of days it has.

2. Be sure you know these facts about time:

60 seconds = 1 minute
60 minutes = 1 hour
24 hours = 1 day
7 days = 1 week

365 days = 1 year
366 days = 1 leap year
52 weeks and 1 day = 1 year

12 months = 1 year
10 years = 1 decade
100 years = 1 century

★**3.** Find out how many hours there are in one week.

MULTIPLYING FIVE

The circus was coming to town. James was going to see it. Each week he had saved 5¢ from his allowance for the ticket. He saved for six weeks. He said the amount he had then saved would buy the ticket. How much had he saved?

Use the pictures of the nickels to count by fives until you have counted 6 fives.

$$6 \times 5¢ = 30¢$$

1. James saved 5¢ each week for nine more weeks so that he would have money to spend for other things. How much did he save in nine weeks?

2. How much had James saved in one week? two weeks? three weeks? four weeks? five weeks? seven weeks? eight weeks?

3. Study each of these multiplication facts for 5. Which fact did you learn when you learned the multiplication facts for 2? for 3? for 4? Make practice cards to help you learn the new facts.

5	5	5	5	5	5	5	5	5
×1	×2	×3	×4	×5	×6	×7	×8	×9
5	10	15	20	25	30	35	40	45

4. The product for each multiplication fact for 5 can be found by counting by 5, by adding 5's, or by multiplying. Why is it better to learn the multiplication facts rather than to count or add?

THE SCHOOL CARNIVAL

(Multiplying by 5)

Five boys went to the school carnival together. Harry bought the tickets for the pet show. Each ticket cost seven cents. How much did Harry pay?

We find the answer by multiplying. $5 \times 7¢ = 35¢$. 5×7 is the reverse of 7×5.

1. Show with dots that two 5's are the same as five 2's.

2. Show that eight 5's are the same as five 8's.

3. Write the products:

5	5	5	5	5	5	5	5	5
×1	×4	×8	×2	×6	×9	×3	×5	×7

These are the reverses. Be sure you know them.

1	2	3	4	5	6	7	8	9
×5	×5	×5	×5	×5	×5	×5	×5	×5
5	10	15	20	25	30	35	40	45

Write the answers to these questions:

4. Each of the five boys bought 2 pieces of candy. How many pieces of candy did they buy all together?

5. The "picture gallery" cost 8¢. Fred bought the five tickets. How much did he pay?

6. John bought each of the boys an apple. Each apple cost 3¢. How much did he spend?

7. Ice cream cups were 9¢ each. How much did Dick pay for 5?

8. Each of the five boys paid 5¢ to fish in the "fish pond." How much did the boys pay all together?

HELP IN MULTIPLYING FIVE

Do you find the multiplication facts for 5 easy to learn? Did you notice that every product ends in 5 or 0? Look at the table:

$1 \times 5 = 5$	$6 \times 5 = 30$
$2 \times 5 = 10$	$7 \times 5 = 35$
$3 \times 5 = 15$	$8 \times 5 = 40$
$4 \times 5 = 20$	$9 \times 5 = 45$
$5 \times 5 = 25$	

When we multiply 5 by an even number (2, 4, 6, or 8), the answer ends in 0.

When we multiply 5 by an odd number (1, 3, 5, 7, or 9), the answer ends in 5.

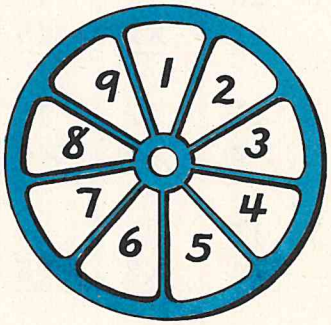
1. What is an even number? What is an odd number?

2. You know that the products are the same when we multiply 5 and when we use the reverse and multiply by 5. See if you can write a statement about multiplying an even number by 5 and another statement about multiplying an odd number by 5.

★**3.** When we add two even numbers is the sum an even number or an odd number? When we add two odd numbers is the sum an even number or an odd number? When we add an even number and an odd number is the sum an even number or an odd number?

Without Paper and Pencil

Multiply each of the numbers between the spokes of the wheel by 2, 3, 4, and 5. Think the example and say the product. Think, "2 × 6." Say, "12."



Time for Practice

When we multiply we have three numbers in the example. The example at the right gives the name of each of these numbers. You should know how to pronounce them and spell them. Your teacher will tell you how to pronounce the two new words.

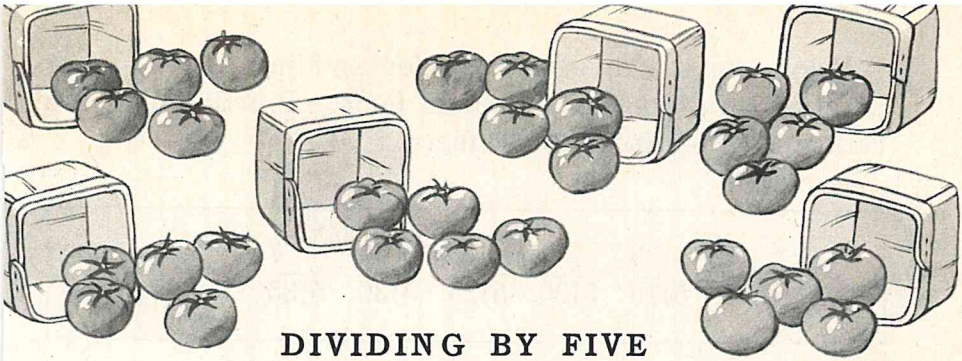
32	**multiplicand**
×3	**multiplier**
96	**product**

Copy these examples and write the products:

	a	b	c	d	e	f	g	h
1.	11	12	13	12	21	24	32	43
	×2	×2	×3	×3	×5	×2	×3	×2
2.	21	41	23	10	30	22	34	40
	×4	×5	×2	×4	×2	×3	×2	×2
3.	62	43	54	41	70	52	62	81
	×2	×3	×2	×4	×5	×3	×4	×5
4.	81	84	72	92	90	63	91	50
	×4	×2	×3	×4	×5	×3	×3	×4

Now copy these examples and write the products:

	a	b	c	d	e	f	g	h
5.	26	28	19	14	16	12	17	25
	×2	×2	×5	×3	×3	×5	×2	×2
6.	25	17	18	14	25	28	19	16
	×3	×5	×4	×4	×4	×5	×4	×4
7.	17	19	36	28	27	39	45	29
	×4	×3	×5	×3	×3	×2	×5	×3



DIVIDING BY FIVE

Henry and his father had a garden. One day they picked more tomatoes than they could use at home. Henry's father said: "Go to the store and buy some small baskets. Put the extra tomatoes in the baskets and you may sell them."

Henry counted the tomatoes that could be sold. There were thirty. He knew that he could put five tomatoes in each basket. He had to find out how many baskets he needed to buy.

Henry said: "One basket will hold 5 tomatoes. Then 2 baskets will hold 10, 3 will hold 15, 4 will hold 20, 5 will hold 25, and 6 will hold 30. I need 6 baskets."

Henry found the answer by counting by 5's. He counted six 5's and knew that he had 30. This is one way to find the answer when you must divide. It is a slow way.

Henry's father said: "You could have subtracted 5's from 30 this way:

$$\begin{array}{r} 30 \\ -5 \\ \hline 25 \end{array} \quad \begin{array}{r} 25 \\ -5 \\ \hline 20 \end{array} \quad \begin{array}{r} 20 \\ -5 \\ \hline 15 \end{array} \quad \begin{array}{r} 15 \\ -5 \\ \hline 10 \end{array} \quad \begin{array}{r} 10 \\ -5 \\ \hline 5 \end{array} \quad \begin{array}{r} 5 \\ -5 \\ \hline 0 \end{array}$$

You could subtract six 5's from 30."

Subtracting is another way to find the answer in division problems. It also is a slow way. The best way is to learn the division facts. Counting or subtracting will help you when you forget the division facts.

Below are the division facts for dividing by 5. Make practice cards for each of these facts. Practice with the cards until you know all the facts.

1	2	3	4	5	6	7	8	9
5)5	5)10	5)15	5)20	5)25	5)30	5)35	5)40	5)45

Problem Practice

Work these problems. Show all your work on your paper.

1. Carol bought three pounds of sugar for her mother. It cost 9¢ a pound. How much did the three pounds cost?

2. Kenneth had 30 carrots to put in bunches of 5 each. How many bunches could he make?

3. Don had seven rows of new stamps in his stamp collection. There were 5 stamps in each row. How many new stamps did Don have?

4. The painter said that it would take 40 hours to paint Mr. Young's house. If the painter worked 5 hours each day on this job, how many days would it take to paint the house?

5. Harry collected 4 pounds of copper. He sold it for 11¢ a pound. How much did he get for his copper?

6. Ralph bought two new bicycle tires. He paid six dollars for them. How much did each tire cost?

7. When Mary had saved $7.00 she went shopping for a new doll bed. She bought one for $5.80. How much of her $7.00 was left?

8. Esther picked 32 roses from her rose garden. She put them in 4 vases, with the same number of roses in each vase. How many roses did Esther put in each vase?

UNEVEN DIVISION BY FIVE

Arthur was chairman of the committee to set out cabbage plants in the school garden. There were 32 plants and there was room for five rows of plants. Arthur drew a picture with dots to help him see how the plants could be arranged.

Study Arthur's picture. He found that, if the cabbage plants were divided with 6 in each row, there were 2 plants left over. If there were 7 in each row, he needed 3 more.

Arthur remembered that this was uneven division. He thought, "32 ÷ 5 = 6 and 2 over."

We can write the division example this way:

```
   6
5)32
  30
   2
```

The number we divide by is called the divisor.

In 32 ÷ 5, the **divisor** is **5.**

Make dot pictures for the following examples in uneven division:

	a	b	c	d
1.	16 ÷ 5	28 ÷ 5	42 ÷ 5	27 ÷ 5
2.	22 ÷ 5	34 ÷ 5	38 ÷ 5	46 ÷ 5

3. What is the quotient in each of the examples?

4. What is the remainder in each of the examples?

5. What is the divisor in each of the examples?

HELP IN UNEVEN DIVISION BY FIVE

How can we best find the quotient and remainder in uneven division?

Study the example at the right.

```
     6
5)34
   30
    4
```

There are not 7 fives in 34 because 7 fives are 35. There are 6 fives in 34 because 6 fives are 30. The quotient is 6.

We think, "6 × 5 = 30," and write 30 under the 34. We subtract 30 from 34 to find the remainder. The remainder is 4.

These are the steps in uneven division:

Think the next smaller number that we can divide evenly by the divisor.

Divide this next smaller number by the divisor.

Find the difference between the number you are dividing and the next smaller number that you can divide evenly by the divisor. This difference is the remainder.

1. Say the next smaller number that you must think to divide these numbers by 5:

a.	11	17	22	26	29	34	38	42	48
b.	8	31	27	14	37	44	32	21	19

2. Divide each of the numbers in Exercise **1** by 5. Write your work as it is written in the example at the top of the page.

Find the answers to these examples. Show all your work on your paper.

	a	b	c	d	e
3.	13 ÷ 5	9 ÷ 5	29 ÷ 4	49 ÷ 5	21 ÷ 5
4.	18 ÷ 5	33 ÷ 5	41 ÷ 5	36 ÷ 5	33 ÷ 4
5.	24 ÷ 5	28 ÷ 5	19 ÷ 4	25 ÷ 4	39 ÷ 5
6.	17 ÷ 4	22 ÷ 5	43 ÷ 5	21 ÷ 4	47 ÷ 5

The numbers below that are printed in heavier figures are the **helpers** for uneven division by 5.

0	1	2	3	4	**5**	6	7	8	9
10	11	12	13	14	**15**	16	17	18	19
20	21	22	23	24	**25**	26	27	28	29
30	31	32	33	34	**35**	36	37	38	39
40	41	42	43	44	**45**	46	47	48	49

7. How do the helpers help us when we divide numbers by 5?

8. Tell which number is the helper when we divide each number below by 5.

8 17 13 39 31 22 27 42 48

9. Which numbers from 0 to 49 have a number left over when we divide by 5?

10. What is the largest number that is left over when we divide by 5?

11. Is this largest number left over larger or smaller than 5? How much larger or smaller is it?

12. Tell why the number left over cannot be larger than 4. What do you know if the number left over is larger than 4?

13. Subtract the first number in each line from each of the numbers that follow it. Write the answers.

a. 15 from	18	16	19	15	17
b. 35 from	39	35	37	36	38
c. 20 from	24	22	20	21	23
d. 45 from	47	45	48	49	46
e. 25 from	25	28	29	26	27
f. 30 from	32	31	34	33	30

THE SCHOOL SHOP

(Different processes in problem solving)

The children in Miss Lane's room worked in the shop. They decided to clean it and put everything in its place. Write the answers to the questions about their work. You will have to decide whether to add, subtract, multiply, or divide to find each answer.

1. Clifford sorted the long nails from the short nails. He had 84 long nails and 78 short ones. How many nails did he have all together?

2. Harry found 162 screws. He counted those with round heads. There were 70. The others had flat heads. How many were there with flat heads?

3. John counted the larger tools. He found 7 saws, 8 mallets, 6 planes, and 4 drills. How many larger tools were there?

4. Mary found 4 boxes of bolts. There were 14 bolts in each box. How many bolts were there in the 4 boxes?

5. Carol and Sue cleaned the drawers in each table. There were 20 tables with 3 drawers in each table. How many drawers did they clean?

6. Each table had a large screw driver, a hammer, and a small saw. How many of these tools all together were there for the 20 tables?

MULTIPLYING WITH ONE

Mary's father gave her money to buy an ice cream bar. Mary knew that it would cost 5¢. She said to the clerk, "I want 1 ice cream bar, please." The clerk said, "That will be 5¢."

Mary's father asked, "Can you make an arithmetic example for me that shows that 1 ice cream bar costs 5¢?"

Mary wrote: $1 \times 5¢ = 5¢$. Is that right?

1. What would the answer have been if an ice cream bar had cost 4¢? 6¢?

2. What is the answer whenever we multiply by 1?

When we multiply a number by 1, the product is the same as the number.

3. Write all the multiplication facts in which you multiply a number by 1, from 1×1 to 1×9.

4. Write the reverses of the multiplication facts you have just written.

5. Show by adding that $4 \times 1 = 4$, $7 \times 1 = 7$, $9 \times 1 = 9$.

6. What is the answer whenever we multiply 1?

When we multiply 1 by a number, the product is the same as the number.

Be sure that you know these number facts:

$1 \times 2 = 2$	$2 \times 1 = 2$
$1 \times 3 = 3$	$3 \times 1 = 3$
$1 \times 4 = 4$	$4 \times 1 = 4$
$1 \times 5 = 5$	$5 \times 1 = 5$

Learn these number facts:

1	6	8	9	1	1	1	1	7
×1	×1	×1	×1	×6	×8	×7	×9	×1
1	6	8	9	6	8	7	9	7

MULTIPLYING WITH TEN

Multiplying with 10 is easy. It is like multiplying with 1. This is because 10 is ten ones or one ten.

7×10 is 7×1 ten. 7×1 ten $= 7$ tens
7 tens are 70. $7 \times 10 = 70$

1. Study these multiplication facts for 10 if you need to:

$1 \times 10 = 10$	$4 \times 10 = 40$	$7 \times 10 = 70$
$2 \times 10 = 20$	$5 \times 10 = 50$	$8 \times 10 = 80$
$3 \times 10 = 30$	$6 \times 10 = 60$	$9 \times 10 = 90$

When we multiply 10 by a one-place number, the product is that number in the tens' place and 0 in the ones' place.

2. Write the reverses for the tens facts in a table like the table above.

When we multiply a one-place number by 10, the product is that number in the tens' place and 0 in the ones' place.

Time for Practice

Copy these examples and write the answers:

1. $\$4.89 + 2.18$ **2.** $\$3.12 \times 4$ **3.** $5\overline{)37}$ **4.** $621 - 119$ **5.** 82×5

6. $4\overline{)30}$ **7.** 8×10 **8.** $84 + 17 + 2$ **9.** $3\overline{)8}$

10. $846 - 217$ **11.** 4×26 **12.** $5\overline{)41}$ **13.** $\$5.38 - 1.39$ **14.** $4\overline{)27}$

15. $\$4.02 \times 5$ **16.** $9 + 6 + 2 + 7$ **17.** $\$5.00 + 3.98$ **18.** $\$4.00 - .10$

DIVIDING A NUMBER BY ITSELF AND BY ONE

John said: "I have 3 apples to divide among my 3 friends. I have 1 apple for each friend."

$3 \div 3 = 1$ Does $2 \div 2 = 1$?

A number divided by itself equals 1.

1. Write the quotients for these division examples. Then make practice cards for the facts.

$4\overline{)4}$ $3\overline{)3}$ $7\overline{)7}$ $2\overline{)2}$ $1\overline{)1}$ $8\overline{)8}$ $5\overline{)5}$ $6\overline{)6}$ $9\overline{)9}$

Betty said: "I have 2 cookies. I have no one to share them with. Two cookies for 1 person means I have both, or 2, for myself."

$2 \div 1 = 2$ Does $3 \div 1 = 3$?

A number divided by 1 equals the number.

2. Write the quotients for these division examples. Then make practice cards for the facts.

$1\overline{)6}$ $1\overline{)3}$ $1\overline{)4}$ $1\overline{)7}$ $1\overline{)2}$ $1\overline{)5}$ $1\overline{)9}$ $1\overline{)8}$ $1\overline{)1}$

Time for Practice

Copy these examples and write the quotients:

	a	b	c	d	e
1.	$4 \div 2$	$6 \div 3$	$4 \div 4$	$6 \div 2$	$2 \div 1$
2.	$2 \div 2$	$8 \div 2$	$12 \div 2$	$15 \div 3$	$5 \div 5$
3.	$9 \div 3$	$6 \div 6$	$12 \div 3$	$3 \div 1$	$14 \div 2$
4.	$5 \div 1$	$8 \div 8$	$21 \div 3$	$18 \div 3$	$7 \div 7$
5.	$10 \div 2$	$16 \div 2$	$4 \div 1$	$8 \div 1$	$1 \div 1$
6.	$3 \div 3$	$24 \div 3$	$18 \div 2$	$27 \div 3$	$9 \div 9$
7.	$6 \div 1$	$10 \div 2$	$9 \div 1$	$8 \div 4$	$7 \div 1$

DIVIDING ZERO BY A NUMBER

1. When Billy and Dick came home from school they sometimes shared equally the cookies in the cooky jar. How many did they each get when there were 4 cookies? 8? 2? 6? 14? 12?

One afternoon the boys went to the jar, but there were no cookies. How many cookies did each get?

If there were no cookies to share, each boy got no cookies. We may make an arithmetic fact from this.

$$0 \div 2 = 0$$

Zero divided by a number equals zero.

2. Say these division facts. Then make practice cards for them.

$1\overline{)0}$	$6\overline{)0}$	$5\overline{)0}$	$2\overline{)0}$	$4\overline{)0}$	$3\overline{)0}$	$9\overline{)0}$	$7\overline{)0}$	$8\overline{)0}$

Do You Remember?

1. Copy these sentences and fill the blanks:

a. A number divided by itself equals —?—.
b. A number divided by 1 equals —?—.
c. Zero divided by a number equals —?—.
d. When we multiply 5 by an even number the answer ends in —?—.

2. Copy these sentences and fill the blanks:

a. The answer when we add is called the —?—.
b. The answer when we subtract is called the —?—.
c. The answer when we multiply is called the —?—.
d. The answer when we divide is called the —?—.

UNEVEN DIVISION BY TWO AND THREE

You remember how to divide in uneven division. We write the work for 16 ÷ 3 this way:

```
   5
3)16
  15
   1
```

The quotient is 5 with a remainder of 1.

1. Divide each of these numbers by 2:

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19

2. Divide each of these numbers by 3:

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29

3. a. Copy the numbers you divided by 2 and underline the helpers.

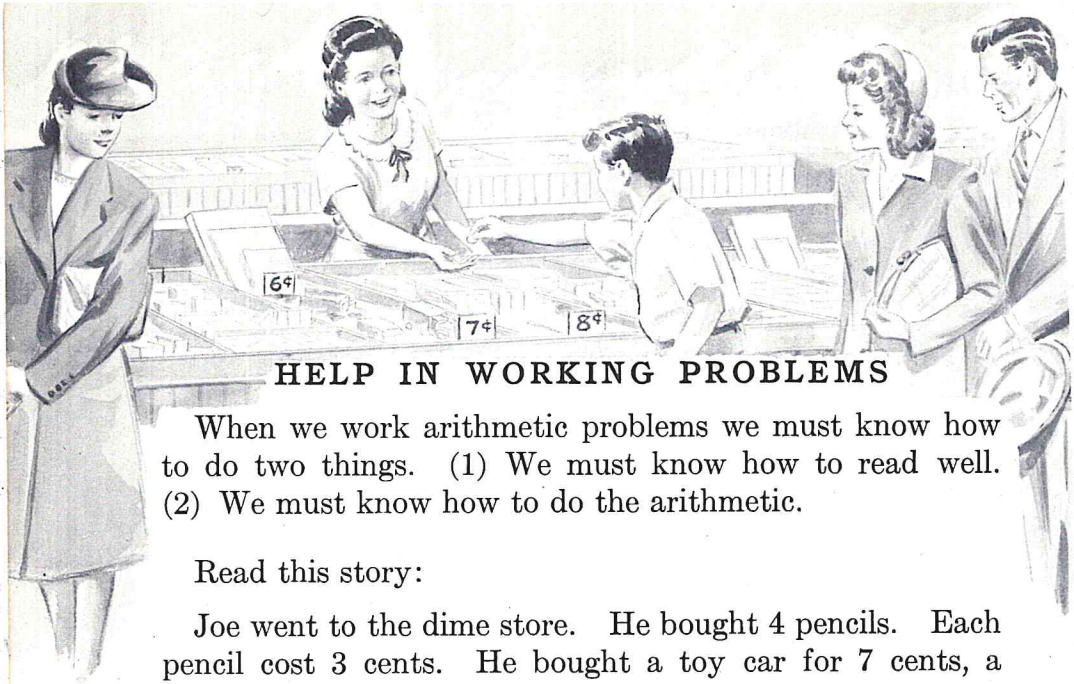
b. Copy the numbers you divided by 3 and underline the helpers.

When we divide a helper, we do not have a remainder.

Numbers in the Home

1. Write as long a list as you can of places where numbers are used in your home. This short list will help you start: house number, telephone number, numbers on the radio dial.

2. Copy all the numbers you can find in your home. Be ready to read these numbers in class if you are asked to.



HELP IN WORKING PROBLEMS

When we work arithmetic problems we must know how to do two things. (1) We must know how to read well. (2) We must know how to do the arithmetic.

Read this story:

Joe went to the dime store. He bought 4 pencils. Each pencil cost 3 cents. He bought a toy car for 7 cents, a notebook for 6 cents, and some rubber bands for 8 cents. He bought a bag of candy for 5 cents. There were 9 pieces of candy in the bag. He shared these equally with Ralph and Phil. Joe had 50 cents with him when he went to the dime store.

Joe and the dime store clerks had to know arithmetic.

1. Joe bought the pencils from one clerk. How much did he pay for them? We must read this part of the story to find the facts we need: "Joe went to the dime store. He bought 4 pencils. Each pencil cost 3 cents."

Now find out how much Joe paid. Do you add, subtract, multiply, or divide? How do you know? How much did Joe pay?

2. Joe bought the toy car, notebook, and rubber bands from another clerk. How much did he pay for them? Read to find the part of the story with the facts you need. Copy this part of the story. Decide whether you should

add, subtract, multiply, or divide. Tell how you know which to do. Now find the answer.

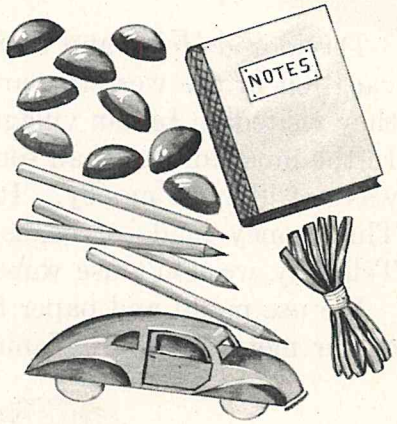
3. When Joe shared his candy how many pieces did each boy get? Read to find the facts you need. Copy them. Decide whether you should add, subtract, multiply, or divide. Tell how you decide which to do. Find the answer to the question.

4. Study the multiplication, addition, and division below. How will this help you to solve the problem?

4 pencils at 3¢ each
Total cost $4 \times 3¢ = 12¢$

Toy car	7¢
Notebook	6¢
Rubber bands	8¢
Total cost	21¢

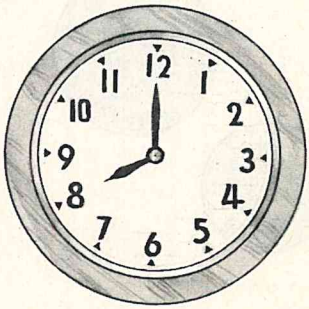
9 pieces of candy for 3 boys
$9 \div 3 = 3$
3 pieces for each boy

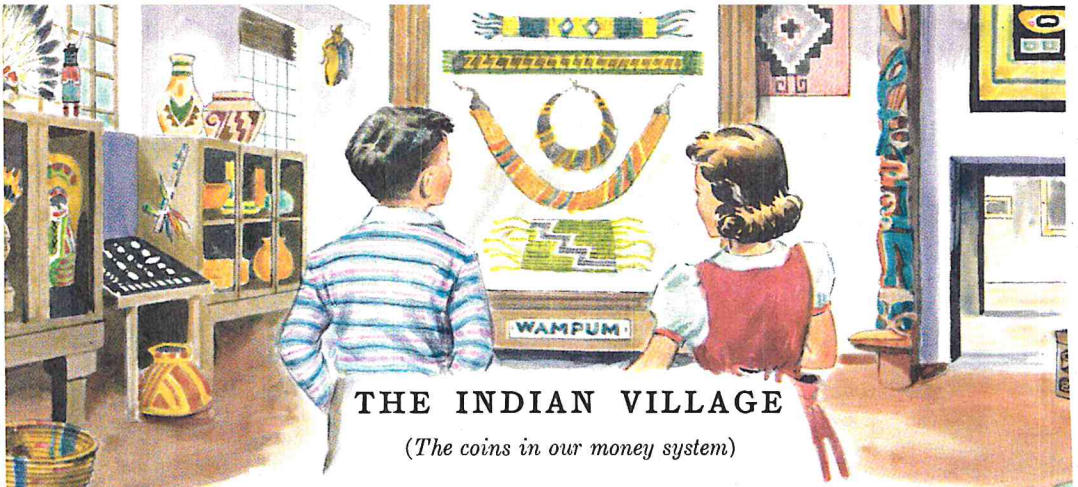


5. Read the whole story again. What facts were not used in the problems? Make up problems using the facts that were not used. You may use the other facts with them if you wish to. Work the problems.

Telling Time

When the clock in the school said seven o'clock the janitor opened the door for the carnival. When the clock said 9:30 the people were told the carnival was over. What time does the clock say now? Where were the hands at 7:00? at 9:30?





THE INDIAN VILLAGE

(The coins in our money system)

David and Helen and their father and mother spent their vacation in the western part of the United States. There they visited an Indian village. The Indians had a museum. In the museum they had some Indian money. This money was not like our money. It was made of beads and shells. This money made of beads and shells is called **wampum.** Tell why we don't use wampum for money.

We use metal and paper for money. Below are pictures of our metal money. Name each piece, or **coin.**

1. Answer these questions:

   a. How many pennies are there in a nickel? a dime? a quarter? a half dollar? a dollar?

   b. How many nickels are there in a dime? a quarter? a half dollar? a dollar?

   c. How many dimes are there in a half dollar? a dollar?

   d. How do the 5's help you count money?

★2. Look up **money** in some other books and write a report on it.

Time for Practice

Copy these examples and write the sums:

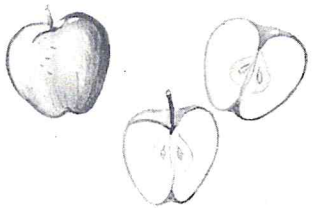
	a	b	c	d	e	f	g
1.	4	5	2	4	9	7	2
	3	4	1	3	2	6	3
	2	4	8	5	3	6	8
	7	8	6	9	4	1	9
2.	12	18	16	23	48	36	7
	13	7	9	15	16	65	29
3.	40	38	47	24	5	29	48
	27	62	31	33	84	49	68

Copy these examples and write the differences:

	a	b	c	d	e	f	g
4.	17	38	69	74	39	86	79
	12	14	43	50	27	41	68
5.	64	56	71	38	97	25	87
	17	38	23	19	48	18	69

A FRACTION TELLS US TO DIVIDE

When an apple is divided into 2 equal parts, each part is $\frac{1}{2}$. To take $\frac{1}{2}$ of something, we have to divide it by 2.

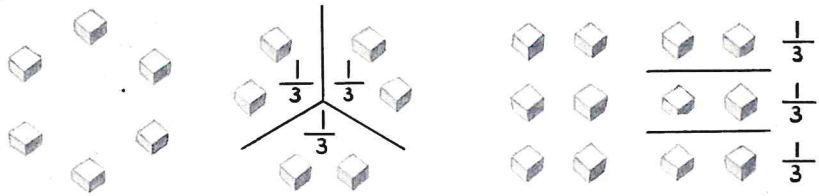


Fractions mean division.

John has 6 pencils. He plans to take $\frac{1}{2}$ of them to school. To find $\frac{1}{2}$ of 6, we divide 6 by 2. $6 \div 2 = 3$. John took 3 pencils to school.

$\frac{1}{2}$ of 6 pencils = 3 pencils

Marcia shared 6 pieces of candy with Carol and Judy. There were three girls; so each girl got $\frac{1}{3}$. $6 \div 3 = 2$. Then $\frac{1}{3}$ of 6 is 2. Each girl got 2 pieces of candy.



The pictures above show two ways of finding $\frac{1}{3}$ of 6 pieces of candy. Each group of 2 pieces is $\frac{1}{3}$ of 6 pieces.

Donald had 9 pennies. He spent $\frac{1}{3}$ of them for a stamp. The picture shows that $\frac{1}{3}$ of 9 pennies equals 3 pennies.

John said that he planned to take $\frac{1}{2}$ of his 6 pencils to school. We call the $\frac{1}{2}$ of 6, or 3, a **fractional part** of 6.

When Marcia shared her candy each of the girls got $\frac{1}{3}$. We call $\frac{1}{3}$ a **fractional part.** To find $\frac{1}{3}$ of 6, we divided 6 by 3.

Donald spent $\frac{1}{3}$ of his pennies. We call $\frac{1}{3}$ of 9, or 3, a **fractional part** of 9.

When we need to find a fractional part of a number such as $\frac{1}{2}$ or $\frac{1}{3}$, we can divide to find out how much the fractional part is.

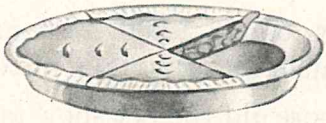
Write the answers to these questions:

1. What is $\frac{1}{2}$ of 4 books?
2. What is $\frac{1}{2}$ of 6 pennies?
3. What is $\frac{1}{3}$ of 9 children?
4. What is $\frac{1}{4}$ of 4 stamps?
5. What is $\frac{1}{2}$ of 8 apples?
6. What is $\frac{1}{3}$ of 6 nails?
7. What is $\frac{1}{2}$ of 2 peaches?
8. What is $\frac{1}{4}$ of 8 chairs?
9. What is $\frac{1}{3}$ of 3 swings?
10. What is $\frac{1}{5}$ of 10 boys?

DRAWING PICTURES

(Enrichment material)

This picture shows three fourths of a pie.



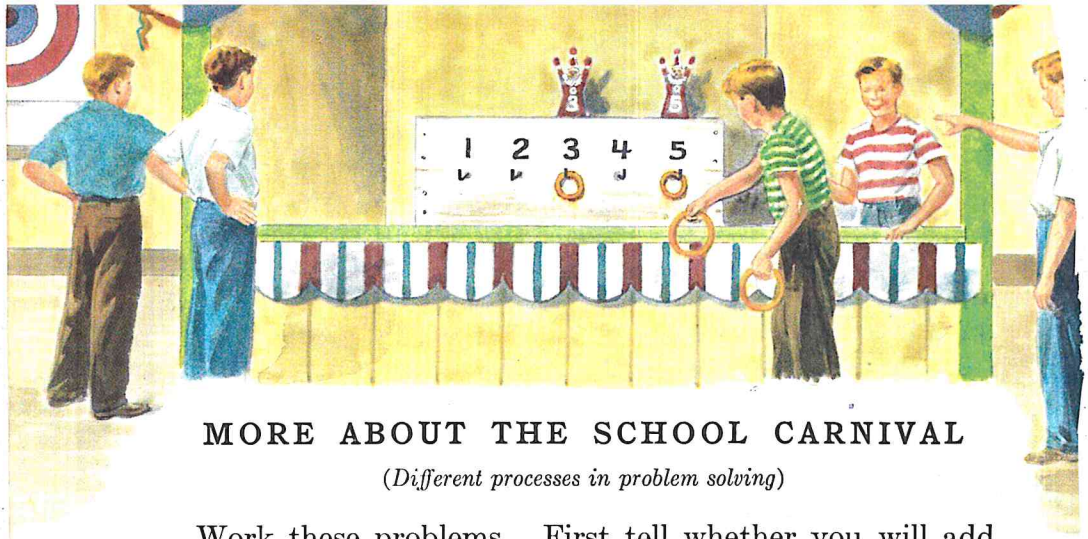
1. Draw a picture which shows one half of an apple.

2. Draw a circle and color $\frac{1}{4}$ of it.

3. Draw a picture of 4 stick men and put a circle around one half of them.

4. Draw a picture that shows $\frac{1}{4}$ of a cake.

5. Draw a picture of 6 candy canes. Color one third of them.



MORE ABOUT THE SCHOOL CARNIVAL

(Different processes in problem solving)

Work these problems. First tell whether you will add, multiply, subtract, or divide. Show all your work on your paper.

1. Four boys played a ring-toss game. Dave scored 6 points, Don scored 9 points, Ben scored 8 points, and Jerry scored 4 points. How much did they score together?

2. Dave and Don played against Ben and Jerry. Which team won? By how many points?

3. Sue's father bought 6 candy bars for Sue and her friends. The candy bars were 5¢ each. How much did he pay?

4. The pet show took in $4.60. The picture gallery took in $3.90. How much did they take in together?

5. How much more did the pet show take in than the picture gallery did?

6. Two rooms shared equally the money from the pet show. How much did each room have when the money was divided?

7. Three rooms shared equally the money from the picture gallery. How much did each room have when the money was divided?

MULTIPLICATION AND DIVISION FAMILIES OF FIVES

You remember that you can find a division fact by subtraction. To find how many 4's there are in 12, you can subtract. You can subtract 4 from 12 three times. $12 \div 4 = 3$. You can also count by 4's until you get to 12.

You can find the division facts for 5 by counting by 5's and by subtracting 5's. Show this for $15 \div 5$, for $35 \div 5$, and for $20 \div 5$.

You also remember that the division facts are related. Study these pairs:

$20 \div 5 = 4$	$30 \div 5 = 6$
$20 \div 4 = 5$	$30 \div 6 = 5$

1. Name the division fact related to each of the following facts:

a. $10 \div 5 = 2$	**c.** $5 \div 5 = 1$	**e.** $45 \div 5 = 9$
b. $35 \div 5 = 7$	**d.** $40 \div 5 = 8$	**f.** $15 \div 5 = 3$

The division facts and multiplication facts make families. Study this family:

$5 \times 6 = 30 \quad 6 \times 5 = 30 \quad 30 \div 5 = 6 \quad 30 \div 6 = 5$

2. Write the multiplication and division family for each of these sets of numbers:

a. 4, 5, 20	**c.** 15, 3, 5	**e.** 45, 5, 9
b. 5, 2, 10	**d.** 35, 7, 5	**f.** 8, 40, 5

Be sure that you know these division facts with 5. Make practice cards and study them until you know all of them.

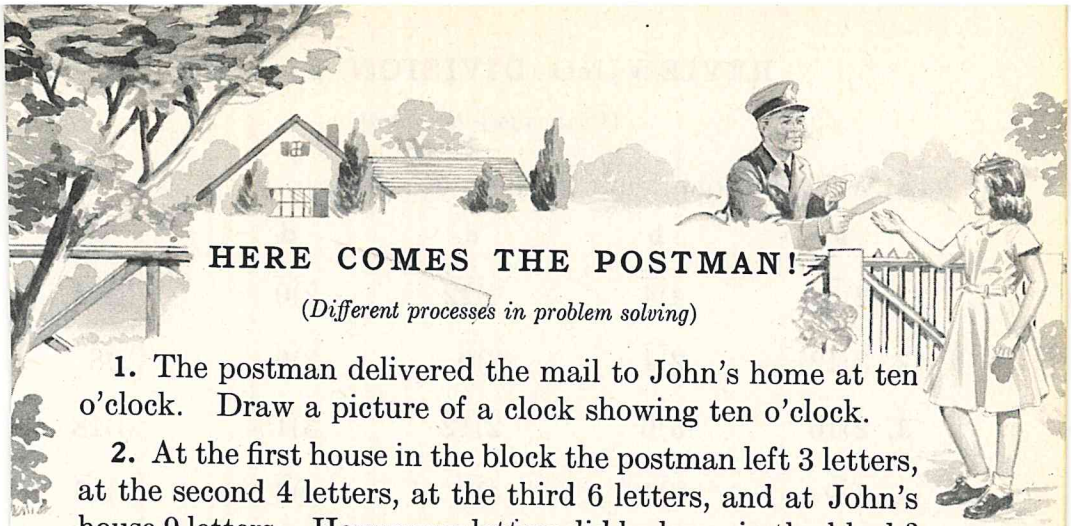
5	5	5	5	5	5	5	5	5
1)5	2)10	3)15	4)20	5)25	6)30	7)35	8)40	9)45

REVIEWING MULTIPLICATION FACTS

(Multiplication facts through 5)

On separate paper write the products:

	a	b	c	d	e	f	g	h	i	j
1.	1	3	2	1	4	0	4	3	2	0
	×1	×2	×2	×2	×3	×1	×0	×1	×0	×2
2.	2	5	6	4	7	9	0	3	0	2
	3	1	2	1	1	1	5	4	3	5
3.	0	2	3	6	2	0	2	1	5	3
	0	1	0	1	4	4	6	5	5	3
4.	1	0	3	1	5	6	1	7	4	5
	4	6	5	3	3	4	0	4	2	0
5.	6	5	4	6	7	3	4	0	1	3
	0	2	4	5	3	6	5	7	8	8
6.	4	5	6	5	7	8	9	7	0	2
	6	6	3	4	0	2	0	2	8	7
7.	1	7	8	9	8	1	8	2	5	3
	6	5	0	2	1	7	3	8	7	7
8.	8	9	7	8	4	4	0	5	7	4
	4	3	4	5	9	6	9	9	3	7
9.	9	6	4	9	3	1	3	3	5	2
	5	5	8	4	8	9	9	6	8	9



HERE COMES THE POSTMAN!

(Different processes in problem solving)

1. The postman delivered the mail to John's home at ten o'clock. Draw a picture of a clock showing ten o'clock.

2. At the first house in the block the postman left 3 letters, at the second 4 letters, at the third 6 letters, and at John's house 9 letters. How many letters did he leave in the block?

3. One day John bought stamps at the post office. He bought 9 stamps that cost 3¢ each. How much did he pay for them?

4. The stamps came in a sheet. John counted them and found 3 rows with 3 in each row. Make an addition example that shows how many stamps there were in the sheet. Give the answer.

5. Make a multiplication example to show how many stamps there were in the sheet. Give the answer.

6. On another day John bought 15 air-mail stamps. They cost 6¢ each. How much did he pay for the air-mail stamps?

★**7.** The postman told John that he walked 24 blocks each time he delivered the mail. He delivered the mail twice each day, Monday through Friday, and once on Saturday. See if you can find out how many blocks the postman walked each week to deliver the mail.

REVIEWING DIVISION FACTS

(Division facts through 5)

Write the quotients to these examples:

	a	b	c	d	e
1.	$2\overline{)2}$	$4\overline{)4}$	$4\overline{)12}$	$2\overline{)0}$	$2\overline{)14}$
2.	$3\overline{)12}$	$2\overline{)4}$	$3\overline{)0}$	$2\overline{)6}$	$2\overline{)8}$
3.	$2\overline{)10}$	$3\overline{)6}$	$2\overline{)12}$	$3\overline{)15}$	$3\overline{)18}$
4.	$3\overline{)9}$	$2\overline{)16}$	$4\overline{)0}$	$4\overline{)8}$	$4\overline{)16}$
5.	$5\overline{)0}$	$5\overline{)15}$	$2\overline{)18}$	$5\overline{)5}$	$5\overline{)40}$
6.	$5\overline{)35}$	$3\overline{)21}$	$4\overline{)20}$	$5\overline{)10}$	$4\overline{)32}$
7.	$3\overline{)24}$	$4\overline{)24}$	$5\overline{)30}$	$3\overline{)27}$	$4\overline{)36}$
8.	$5\overline{)20}$	$3\overline{)3}$	$5\overline{)25}$	$4\overline{)28}$	$5\overline{)45}$

NUMBERS ARE FUN

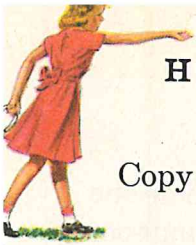
(Enrichment material)

1. Add the numbers in the square in each direction. Is the sum the same in each direction? If so, this is another magic square.

1	8	10	15
14	11	5	4
7	2	16	9
12	13	3	6

2. Change the numbers in the square so that the rows always add to 54.

3. Change the numbers in the square so that the rows always add to 42.



HOW MUCH HAVE YOU LEARNED?

(Chapter Test 3)

Copy these examples and write the answers:

	a	b	c	d
1.	4×2	4×8	$12 \div 4$	$24 \div 8$
2.	5×6	5×5	$25 \div 5$	$20 \div 4$
3.	4×7	4×0	$35 \div 7$	$28 \div 4$
4.	8×4	6×5	$36 \div 4$	$4 \div 4$
5.	9×5	8×5	$30 \div 5$	$10 \div 2$

	a	b	c	d	e
6.	$5\overline{)17}$	$4\overline{)18}$	$3\overline{)28}$	$2\overline{)11}$	$4\overline{)26}$
7.	$5\overline{)28}$	$4\overline{)11}$	$4\overline{)33}$	$5\overline{)9}$	$5\overline{)47}$
8.	$\begin{array}{r}17\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}32\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}24\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}37\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}60\\ \times 4\\ \hline\end{array}$
9.	$\begin{array}{r}67\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}80\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}49\\ \times 5\\ \hline\end{array}$	$\begin{array}{r}38\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}75\\ \times 5\\ \hline\end{array}$

10. What is:

a. $\frac{1}{2}$ of 4 pennies? **b.** $\frac{1}{3}$ of 6 books? **c.** $\frac{1}{4}$ of 4 apples?

11. In the example $5 \times 40 = 200$ the answer 200 is called the —?—.

12. In the same example the number 5 is called the —?—.

13. In the same example the number 40 is called the —?—.

14. When we need to find a fractional part of a number we can —?—.

IMPROVE YOUR SKILLS

(Diagnostic Test 2)

Work each set of examples. If you miss more than one example in any set, you need to review. The number printed in heavier figures after the set tells you which page to review.

	a	b	c			d	e	f	
1.	42×3	64×2	53×3	**(46)**	**2.**	$2\overline{)44}$	$3\overline{)63}$	$3\overline{)369}$	**(48)**
3.	76×2	25×3	48×3	**(49)**	**4.**	622×3	134×2	413×3	**(50)**

HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 3)

Work these problems. Show all your work on your paper.

1. John bought 8 stamps which cost 3¢ each. How much did all the stamps cost?

2. Clara bought a doll for $5.75 and a doll bed for $3.98. How much did the two things cost?

3. Billy played a dart game. On his first throw he made 6, on his second 7, on his third 4, and on his fourth 8. What was his total score?

4. Harry and his father washed 24 storm windows in 3 hours. If they washed the same number of windows each hour, how many did they wash in one hour?

5. Ann weighed 58 pounds when she was seven years old. She weighed 72 pounds when she was nine. How much did she gain in the two years?

6. Jean's mother bought 4 quarts of berries at 54¢ a quart. How much did the berries cost?

7. One Saturday five boys helped sort potatoes on Mr. Blue's farm. They sorted 35 bushels. If each boy sorted the same number of bushels, how many did each boy sort?

8. If a quart of ice cream makes 10 ice cream cones, how many cones can be made from 7 quarts?

9. Clarence worked 3 days and earned twelve dollars. If he earned the same amount each day, how much did he earn in one day?

10. James bought 14 marbles. He gave $\frac{1}{2}$ of them to his brother Roy. How many marbles did he give Roy?

DO YOU LEARN AND REMEMBER?

(Progress Test 2)

Copy these examples and write the answers:

1. $\begin{array}{r} 6 \\ 8 \\ 2 \\ \underline{7} \end{array}$ **2.** $\begin{array}{r} 407 \\ \underline{+836} \end{array}$ **3.** $\begin{array}{r} 82 \\ \underline{-68} \end{array}$ **4.** $5\overline{)28}$

5. $\begin{array}{r} \$3.76 \\ \underline{+5.87} \end{array}$ **6.** $\begin{array}{r} 432 \\ \underline{-211} \end{array}$ **7.** $\begin{array}{r} \$6.30 \\ \underline{-5.79} \end{array}$

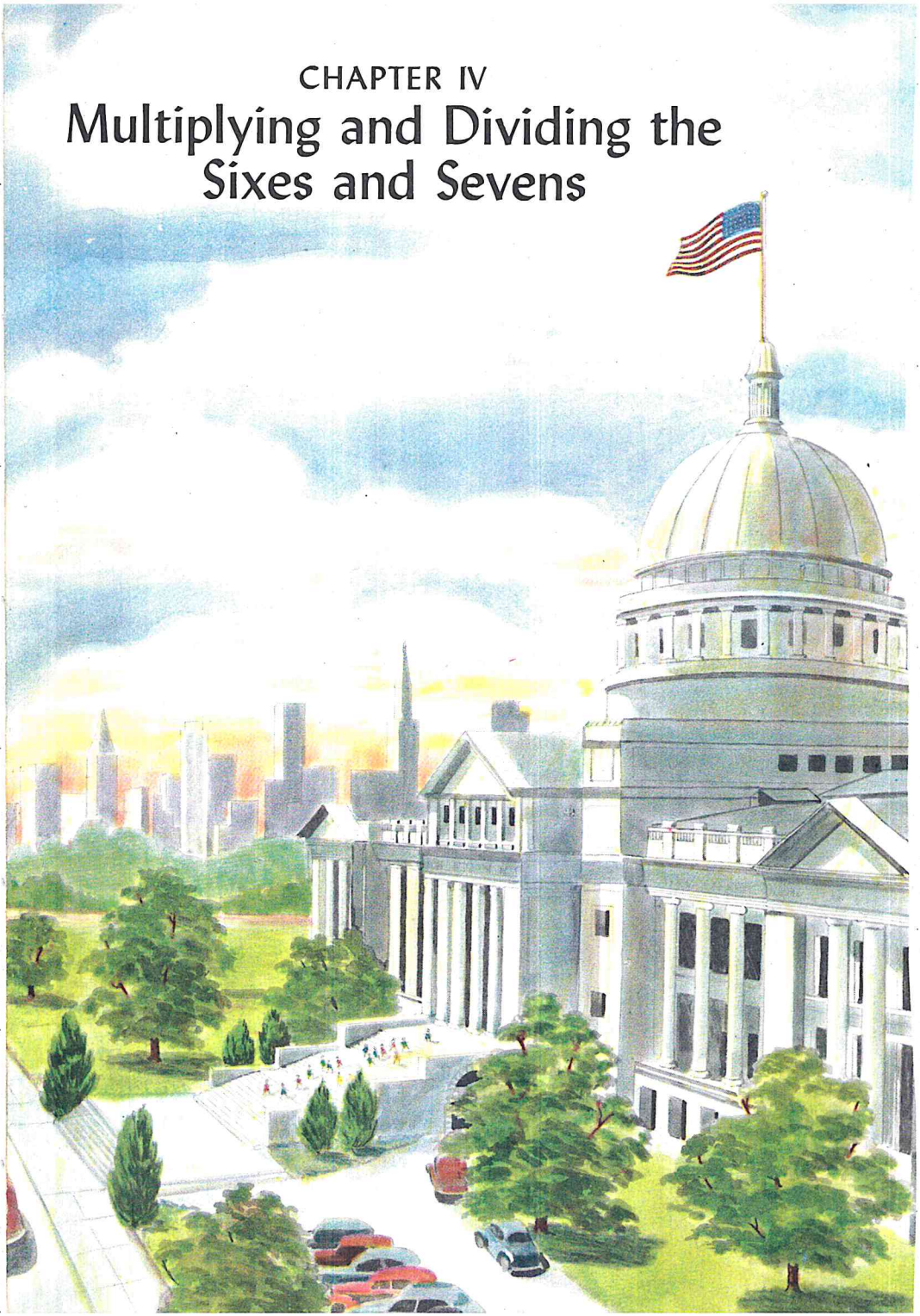
8. $\begin{array}{r} 9 \\ 7 \\ 8 \\ \underline{6} \end{array}$ **9.** $4\overline{)27}$ **10.** $3\overline{)17}$ **11.** $5\overline{)18}$

12. $\begin{array}{r} 38 \\ \underline{\times 5} \end{array}$ **13.** $\begin{array}{r} 79 \\ \underline{\times 4} \end{array}$ **14.** $\begin{array}{r} 67 \\ \underline{\times 5} \end{array}$

15. $\begin{array}{r} 128 \\ \underline{+959} \end{array}$ **16.** $\begin{array}{r} 849 \\ \underline{-468} \end{array}$ **17.** $\begin{array}{r} \$7.90 \\ \underline{+7.98} \end{array}$ **18.** $\begin{array}{r} \$6.95 \\ \underline{-3.87} \end{array}$

CHAPTER IV

Multiplying and Dividing the Sixes and Sevens



A VISIT TO THE CAPITOL BUILDING

The boys and girls of Highland School visited their state capitol. In what city is your state capitol? If you have seen it, describe it to the class. Find pictures of your capitol to bring to class.

1. The pupils went by bus. The bus left at nine o'clock in the morning. Draw a picture of a clock showing the time the bus left. Did the bus leave at 9:00 A.M. or 9:00 P.M.?

2. The bus brought the pupils back at 2:45 in the afternoon. Draw a clock picture to show this time. Is it A.M. or P.M.?

3. A guide showed the boys and girls the building. He told them the tower was 247 feet high. Tell how much higher you think this is than your schoolroom ceiling; the gymnasium ceiling; the school building itself.

4. Thirty pupils made the trip. Each paid 6 cents for the bus ride. What was the total amount of the bus fares?

5. The thirty pupils divided into groups of five to look at the capitol. How many pupils were there in each group?

6. Three of the boys bought large colored pictures of the capitol. Each picture cost 29¢. How much did all three pictures cost?

7. Eighteen of the pupils bought one colored post card each. Each card cost 4¢. How much did the 18 cards cost?

8. Each of the pupils brought a lunch, but each bought a glass of milk. The milk cost 5¢ a glass. How much did the milk for the 30 pupils cost?

9. The capitol was built in 1893. Write this date in words.

*** 10.** How many years is it since the capitol was built?

MULTIPLYING SIX

Each of the children who lived near Helen made a snow man. There were five snow men. The children decided to use pieces of coal for buttons. They wanted 6 buttons for each snow man. How many pieces of coal did they need for all the snow men?

You know that we multiply to find the answer. Five 6's are 30. The children needed 30 pieces of coal.

1. How many pieces of coal did the children need for 2 snow men? for 3? for 4? for 5?

2. How many pieces of coal would they have needed if they had made 7 snow men? 8? 9? 0? 6?

3. Study these multiplication facts for 6. Tell which facts you have learned before. Make practice cards for the new facts.

6	6	6	6	6	6	6	6	6	6
×0	×1	×2	×3	×4	×5	×6	×7	×8	×9
0	6	12	18	24	30	36	42	48	54

Work these problems. Show all your work on your paper.

4. May walked the 6 blocks between her home and school 4 times each day. How many blocks was that all together?

5. Sam bought 7 balloons for 6¢ each. How much did he pay for the balloons?

6. Harry counted the spokes in the wheels of his wagon. There were 6 spokes in each wheel. How many spokes were there in the 4 wheels?

MULTIPLYING BY SIX

You can find the answer to 6 times any number by making tallies. Count the tallies to answer these questions:

1. How many are 6 ones? | | | | | |
2. How many are 6 twos? || || || || || ||
3. How many are 6 threes? ||| ||| ||| ||| ||| |||
4. How many are 6 fours? |||| |||| |||| |||| |||| ||||

6 ones or $6 \times 1 = 6$ 6 threes or $6 \times 3 = 18$
6 twos or $6 \times 2 = 12$ 6 fours or $6 \times 4 = 24$

5. Find the answer by making tallies for:

6×5 6×6 6×7 6×8 6×9

Did you notice that 6 times a number gives the same product as that number times 6?

6. Write the answers to these facts:

6	6	6	6	6	6	6	6	6	6
×2	×0	×1	×5	×7	×4	×3	×6	×9	×8

7. These are the facts for "6 times." Be sure you know them.

0	1	2	3	4	5	6	7	8	9
×6	×6	×6	×6	×6	×6	×6	×6	×6	×6
0	6	12	18	24	30	36	42	48	54

Do It Quickly

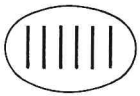
Write the sums without copying these examples:

	a	b	c	d	e
1.	5+3+2	5+7+9	6+3+8	2+7+4	7+9+5
2.	18+6	32+8	41+6	93+9	84+7

DIVIDING WITH SIX

1. Ann lived on the shore of a lake. She invited the children in her room to a picnic at her home. Ann's father took everyone for a ride in his boat. He took 6 children at a time. There were 30 children at the picnic. How many trips did he make?

Find the answer by making tallies like this: Make 30 tallies. Draw a circle around each group of 6. How many groups do you have?



We find the answer to problems like the one above by dividing.

$30 \div 6 = 5$

Ann's father made 5 trips with his boat.

2. Study these division facts for 6:

0	1	2	3	4	5	6	7	8	9
6)0	6)6	6)12	6)18	6)24	6)30	6)36	6)42	6)48	6)54

3. The division facts for 6 are related to the division facts that have 6 as the quotient. Study the facts in the box below:

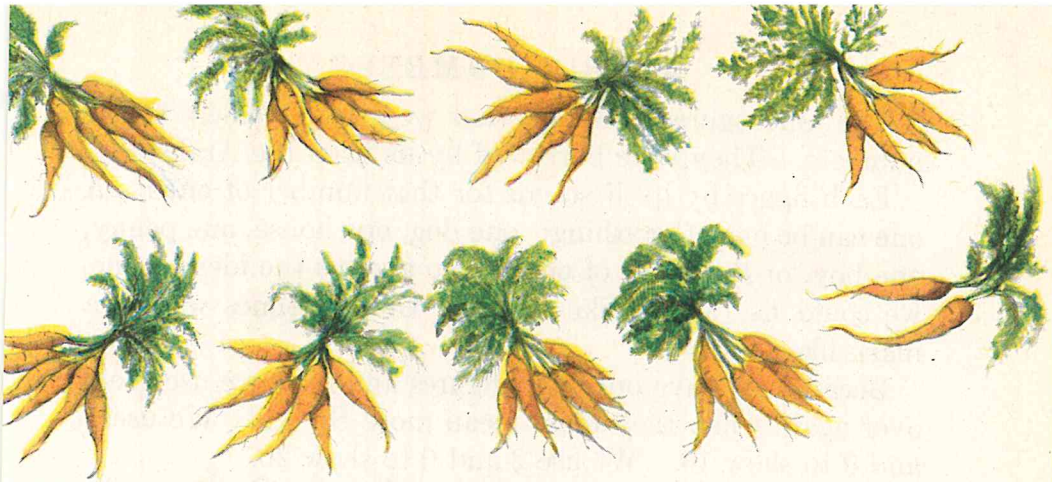
6	6	6	6	6	6	6	6	6
1)6	2)12	3)18	4)24	5)30	6)36	7)42	8)48	9)54

4. This is the multiplication and division family for 6, 12, and 2:

$2 \times 6 = 12 \quad 6 \times 2 = 12 \quad 12 \div 2 = 6 \quad 12 \div 6 = 2$

Write the members of the multiplication and division family for each of these examples:

a. 3×6 **c.** $24 \div 6$ **e.** 6×8 **g.** 6×1
b. 6×5 **d.** $36 \div 6$ **f.** 7×6 **h.** $54 \div 9$



UNEVEN DIVISION BY SIX

Paul helped his father put carrots into bunches to be sold. Paul counted the carrots first and found 50.

His father said, "We will put 6 carrots in each bunch."

Paul said, "If we had 48 carrots, we would have 8 bunches because $48 \div 6 = 8$."

Paul's father replied: "That is right. We have 50 carrots; so we shall have 2 left over."

We can write the division example this way:

$$\begin{array}{r} 8 \\ 6\overline{)50} \\ \underline{48} \\ 2 \end{array}$$

In uneven division with 6 we first have to find the next smaller number that can be divided by 6 evenly.

1. Tell which of the following numbers can be divided by 6 evenly:

30 34 48 25 24 36 57 54 42

2. Tell the next number smaller than each of the following that can be divided by 6 evenly:

a. 20 47 13 34 49 26 31 56 40 59

b. 17 41 29 25 39 52 44 11 50 55

3. Divide each of the numbers in Exercise **2** by 6. Write all your work.

ARABIC NUMBERS

The nine figures and zero that we use are called Arabic numbers. They were borrowed by us from the Arabs.

Each figure by itself stands for that number of **ones.** A **one** can be one of anything: **one** dog, **one** house, **one** penny, **one** boy, or the "idea of **one.**" To give us the idea of one, we could use a dot, like this: • Or sometimes we use a mark like this: I

Because we have only nine figures and zero, we use them over again when they must mean more than 9. We use 1 and 0 to show 10. We use 2 and 0 to show 20.

Because our number system starts over with 10 we say it is a **decimal** system. **Decimal** means **ten.**

ROMAN NUMBERS

The Romans of olden times had a different system of numbers. Today we sometimes use their numbers.

The Romans used letters to stand for numbers. These letters are called Roman numbers.

I is the same as 1.

V is the same as 5.

X is the same as 10.

The Romans used I, V, and X to write numbers to 39. To show 2, they used two I's, or 2 ones. Their numbers are not as easy to use as the numbers of the Arabs. We use Arabic numbers for most things.

These are the Roman numbers for numbers 1 to 30:

I = 1	VI = 6	XI = 11
II = 2	VII = 7	XII = 12
III = 3	VIII = 8	XIII = 13
IV = 4	IX = 9	XIV = 14
V = 5	X = 10	XV = 15

XVI = 16	XXI = 21	XXVI = 26
XVII = 17	XXII = 22	XXVII = 27
XVIII = 18	XXIII = 23	XXVIII = 28
XIX = 19	XXIV = 24	XXIX = 29
XX = 20	XXV = 25	XXX = 30

1. Study the Roman numbers. You need not memorize them. See if you can tell the rules the Romans used in writing numbers.

2. Find as many ways as you can in which Roman numbers are used in your school. Look through your schoolbooks and at other materials in your classroom. Write ways you have found.

3. Write all the reasons you can why we still use Roman numbers.

CHECKING DIVISION

We check our work in division by multiplying.

Study the examples at the right. To check the quotient, the number by which we divided is multiplied by the quotient. The answer is the number that was divided.

When there is a remainder in division, we must first multiply and then add the remainder. The answer should be the number that was divided.

	Divide	Check
A	5 6)30	6 5 30
B	5 6)33 30 3	6 5 30 +3 33

Copy these examples and write the answers. Check your answers.

a. 4)20 **b.** 5)15 **c.** 6)35 **d.** 3)22 **e.** 4)14

HELP IN UNEVEN DIVISION BY SIX

1. Copy these numbers and underline the helpers for dividing by 6:

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59

2. When the number we are dividing by 6 is **one larger** than the helper what is the remainder?

3. When the number we are dividing by 6 is **one smaller** than the helper what is the remainder?

4. Which are the numbers that you cannot divide by 6 and have at least a quotient of 1?

5. Subtract the first number in each line from each of the numbers that follow it. Write the answers.

a. 12 from	15	13	17	14	16
b. 24 from	28	27	25	29	26
c. 42 from	47	43	46	44	45
d. 30 from	32	35	31	33	34
e. 54 from	56	59	58	57	55
f. 18 from	22	19	21	20	23
g. 36 from	40	39	37	38	41
h. 48 from	50	49	51	53	52

6. Divide each of the following by 6. Make your work look like the example at the right.

```
    5
6)34
  30
   4
```

a. 13	27	38	50	43	11	56
b. 17	19	53	25	31	58	40
c. 20	41	29	49	51	32	59
d. 26	34	47	45	55	33	57

HOW MUCH DO YOU BUY?

When you buy groceries do you tell the grocer you want **some** sugar or **some** eggs? Would he know how much to give you? You say something like, "I want 5 pounds of sugar," or, "I want 2 dozen eggs."

Tell how you would ask for these common things we buy:

milk	cheese	gasoline	cream
butter	meat	maple syrup	ice cream

We buy things that are **liquid** by the pint, quart, or gallon. What does **liquid** mean?

2 pints (pt.) = 1 quart (qt.)

4 quarts = 1 gallon (gal.)

We buy things which are **solid,** like butter or cheese, by the pound.

16 ounces (oz.) = 1 pound (lb.)

Sometimes we do not buy things by the pound or quart. We ask for some things by names of their own. How is each of the things in the picture bought?

WORDS HELP US

(Deciding whether to add or subtract)

When we work problems there are certain words that help us to decide whether to add or subtract. Study this problem:

John earned $1.80 one week on his paper route. The next week he earned $1.90. How much did he earn in the two weeks **together?**

The word **together** helps us to know that we should add. When $1.80 and $1.90 are added, their sum, $3.70, tells us how much John earned in the two weeks.

$$\begin{array}{r} \$1.80 \\ +1.90 \\ \hline \$3.70 \end{array}$$

Certain other words help us decide to subtract. Study this problem. Read it carefully. Find how it is different from the problem above.

John earned $1.80 one week on his paper route. The next week he earned $1.90. **How much more** did he earn the second week?

The words **how much more** help us to know that we should subtract. When $1.80 is subtracted from $1.90, the remainder, $.10, tells us how much more John earned the second week.

$$\begin{array}{r} \$1.90 \\ -1.80 \\ \hline \$\ .10 \end{array}$$

Such words as **both, together,** and **all together** often mean that we must add.

Such words as **difference, how much more, how much larger, how much less,** or **how many fewer** often mean that we must subtract.

Tell which words in each of the problems on the next page help us decide whether to add or subtract. Then work the problem. Show all your work and be sure it checks.

1. Ann bought shoes that cost $5.20 and socks that cost $.88. How much did they cost together?

2. How much more did Ann pay for her shoes than for her socks?

3. Fred picked 34 quarts of berries from his patch one week. The next week he picked 27 quarts. How many quarts fewer did he pick the second week?

4. Robert is 57 inches tall. Harry is 53 inches tall. How much taller is Robert?

5. Phyllis found 18 tulips in bloom in her garden one morning. The next morning she found 31 more tulips in bloom. How many were there both mornings?

6. John weighs 68 pounds. His sister May weighs 53 pounds. How much less than John does May weigh? What is the difference in their weight?

7. On their vacation at the seashore Marie and David gathered sea shells. Marie gathered 108. David gathered 97. How many did they gather all together?

8. How many more shells did Marie gather than David did?

9. Jerry and Peter spent their vacation on a lake where there were pine trees. Jerry gathered 84 large pine cones and 97 small pine cones. How many pine cones did he have of both kinds?

10. Peter gathered 79 large cones and 102 small cones. How many more small cones than large cones did Peter gather?

★11. How many large cones did the boys have together? How many small cones did they have together? Which did they have more of? How many more?

Time for Practice

Copy these examples and find the products. Check your work by going over it carefully.

	a	b	c	d	e	f	g
1.	12	31	64	27	39	18	50
	×6	×6	×6	×6	×6	×6	×6
2.	45	73	96	87	54	68	29
	×6	×6	×6	×6	×6	×6	×6
3.	77	17	43	34	49	76	28
	×6	×5	×4	×5	×6	×3	×6
4.	67	48	83	58	36	29	49
	×4	×5	×6	×3	×6	×4	×3

These are for extra practice:

5.	39	34	42	62	38	38	92
	×5	×4	×6	×4	×6	×3	×5
6.	29	44	59	90	67	57	28
	×3	×6	×4	×6	×5	×6	×4

Time for Practice

Copy these examples and find the quotients. Check your work by multiplying or by multiplying and adding.

	a	b	c	d	e	f
1.	6)42	6)33	6)20	6)49	6)25	6)10
2.	4)37	5)41	6)13	3)22	4)6	6)39
3.	5)16	3)27	6)59	4)28	6)55	4)23

DIVIDING BY LARGER NUMBERS

(Review)

You have learned that we can divide tens just as we divide ones. You also know that we can divide hundreds just as we divide tens and ones. We divide money numbers just as we divide other numbers.

Henry worked four days and earned $8.40. If he earned the same amount each day, how much did he earn in a day?

$$\begin{array}{r} \$2.10 \\ 4\overline{)\$8.40} \end{array}$$

Study the way the example was worked. The 8 dollars were first divided by 4. Then the 4 dimes were divided by 4. Last the 0 pennies were divided by 4.

Henry earned $2.10 in a day.

Copy these examples and find the quotients:

	a	b	c	d	e
1.	$2\overline{)42}$	$4\overline{)44}$	$5\overline{)555}$	$6\overline{)606}$	$3\overline{)96}$
2.	$3\overline{)633}$	$5\overline{)55}$	$4\overline{)84}$	$6\overline{)66}$	$3\overline{)39}$
3.	$4\overline{)484}$	$6\overline{)\$6.66}$	$5\overline{)550}$	$3\overline{)\$.93}$	$4\overline{)888}$
4.	$3\overline{)\$9.60}$	$4\overline{)808}$	$5\overline{)\$5.05}$	$4\overline{)480}$	$6\overline{)\$6.60}$

Do It Quickly

★ Write the answers without copying these examples:

1.	Add 14 to:	8	13	20	63
2.	Subtract 13 from:	17	23	20	30
3.	Subtract 30 from:	40	37	50	76
4.	Add 20 to:	7	21	40	52
5.	Subtract 16 from:	18	36	49	56
6.	Add 50 to :	10	24	37	50

WRITING MONEY NUMBERS

We write money numbers in several different ways.

If the number is less than one dollar, we may write it this way: **47¢**. We read this **forty-seven cents.**

We may also write numbers less than one dollar this way: **$.85.** We read this **eighty-five cents.**

If the number is one dollar or more, we write it this way: **$2.75.** We read this **two dollars and seventy-five cents.**

Read these money numbers aloud:

	a	b	c	d	e
1.	68¢	$1.43	$.90	$.07	99¢
2.	$10.11	$1.01	4¢	$6.16	$13.03

In a money number such as $8.36 the period between the 8 and the 3 is called a **decimal point.** The decimal point separates the dollars number from the cents number. The number to the left of the decimal point is the dollars number. The number to the right of the decimal point is the cents number. There must always be two figures to the right of the decimal point when we write dollars and cents.

Sometimes we have money numbers that have dollars and no cents. We may write the money number **five dollars** in figures this way: **$5.00.** What do the zeros tell us?

Write these money numbers:

	a	b
3.	Two dollars and fifty cents	Three dollars and twenty-one cents
4.	Four dollars and ten cents	Seven cents
5.	Sixteen dollars and six cents	Twenty dollars and two cents
6.	Ninety-six cents	Eleven dollars

Time for Practice

Copy these examples and write the products:

	a	b	c	d	e
1. Multiply by 3:	11	33	222	803	906
2. Multiply by 4:	12	20	212	520	421
3. Multiply by 5:	11	21	301	420	115
4. Multiply by 6:	9	42	311	504	416

Read the following numbers aloud:

	a	b	c	d
5.	1394	4205	7063	1001
6.	2468	4800	7008	5678
7.	3079	5050	8090	7003

8. Your teacher will read the numbers above. As she reads write each number.

9. Add 10 to each number that you have written.

10. Add 100 to each number that you have written.

11. Add 1000 to each number that you have written.

Do It Quickly

Write the products without copying the examples. You should get all the answers right.

	a	b	c	d	e	f	g	h
1.	6	1	6	0	7	7	2	7
	×2	×7	×1	×6	×1	×3	×7	×5
2.	1	2	6	7	9	6	7	6
	×6	×6	×0	×2	×6	×6	×6	×5
3.	7	0	6	6	4	3	6	7
	×4	×7	×4	×3	×7	×6	×7	×0
4.	4	6	5	6	3	8	5	7
	×6	×9	×7	×8	×7	×6	×6	×6

MULTIPLYING SEVEN

Betty's classroom had worktables. Seven pupils could work at each table. The pupils were divided into groups to work at the tables. In the picture we see Betty's group working.

How many pupils were there when four groups of pupils worked? We find the answer by multiplying. $4 \times 7 = 28$. The answer is 28 pupils. We could also find the answer by adding. Show how.

We have already learned these multiplication facts for 7:

7	7	7	7	7	7	7
×0	×1	×2	×3	×4	×5	×6
0	7	14	21	28	35	42

Study these new facts. Make practice cards for them.

7	7	7
×7	×8	×9
49	56	63

1. Each of the 7 pupils in a work group was given 3 sheets of white paper. How many sheets were needed for each work group?

2. Each pupil in a work group had a box of 8 crayons. How many crayons did the 7 pupils have all together?

3. In getting ready for a school party each pupil in one work group made 4 cups for nuts. How many cups did they make?

4. The pupils of another group made stars for decorations. Each pupil made 9 stars. How many stars were made all together?

5. A third group made name cards. Each pupil made 5. How many name cards were there?

6. There were 4 work groups in the room. How many pupils were there?

MULTIPLYING BY SEVEN

1. Name the days of the week. There are seven.

Jerry wanted to buy a ball that cost 49¢. He said, "If I save 7¢ each day for one week, I will have 49¢." He knew this because he knew that there are 7 days in a week and that seven 7's are 49.

2. How much would Jerry have had if he had saved 8¢ each day for 7 days? How much would he have had if he had saved 9¢ each day for 7 days?

3. Write the products for the following:

7	7	7	7	7	7	7	7	7	7
×4	×0	×5	×1	×2	×9	×3	×8	×6	×7

4. The facts for "7 times" are the reverses of the facts for multiplying 7. Be sure you know the facts below.

0	1	2	3	4	5	6	7	8	9
×7	×7	×7	×7	×7	×7	×7	×7	×7	×7
0	7	14	21	28	35	42	49	56	63

Time for Practice

Copy these examples and find the products:

	a	b	c	d	e	f	g
1.	11	21	24	32	41	18	26
	×7	×7	×7	×7	×7	×7	×7
2.	19	27	40	91	51	60	35
	×7	×7	×7	×7	×7	×7	×7
3.	30	42	28	90	14	72	57
	×3	×5	×6	×7	×7	×5	×3
4.	76	37	80	16	49	17	70
	×2	×4	×5	×7	×3	×6	×7

Time for Practice

Copy these examples and find the answers:

	a	b	c	d	e
1.	307	84	893	4)48	60
	+706	×7	−148		×5
2.	6)37	62	569	616	6)66
		×7	+384	−108	

Writing Numbers

Write the following numbers in words:

	a	b	c	d	e
1.	704	4803	5093	1141	911
2.	382	9742	8700	5050	4017
3.	616	6007	2309	3047	808

Time for Practice

Copy these examples and find the sums. Check your work.

	a	b	c	d	e	f	g
1.	19	64	37	82	38	76	59
	10	32	48	35	64	38	49
2.	$.48	$.29	$.17	$.92	$.33	$.87	$.75
	.19	.47	.93	.49	.66	.36	.25

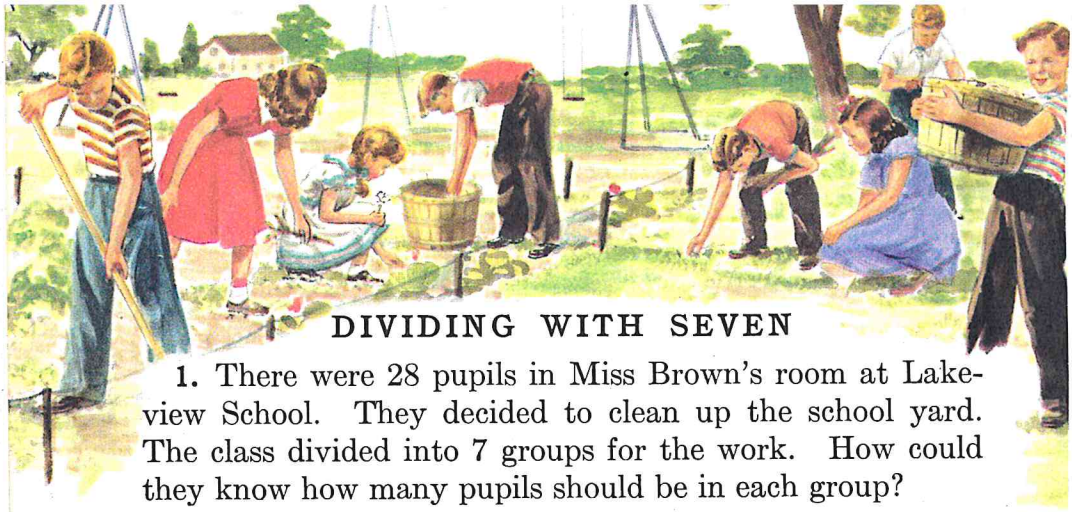
	a	b	c	d	e	f
3.	405	397	482	738	193	684
	208	703	511	612	209	675
4.	$5.27	$8.90	$9.19	$2.66	$7.07	$3.48
	7.13	9.70	1.11	4.03	6.06	5.94

Time for Practice

Copy these examples and find the differences. Check your work.

	a	b	c	d	e	f	g
1.	48	73	95	86	57	29	66
	−17	−21	−43	−62	−26	−17	−23
2.	$.98	$.76	$.21	$.39	$.44	$.68	$.89
	−.42	−.41	−.10	−.29	−.21	−.23	−.45

	a	b	c	d	e	f
3.	483	961	847	558	672	332
	−127	−438	−219	−309	−418	−119
4.	286	435	616	317	527	915
	−87	−136	−243	−308	−243	−116



DIVIDING WITH SEVEN

1. There were 28 pupils in Miss Brown's room at Lakeview School. They decided to clean up the school yard. The class divided into 7 groups for the work. How could they know how many pupils should be in each group?

Seven captains were chosen. Each captain chose one pupil. Then each captain chose another pupil. When all were chosen there were 4 in each group. Draw stick pictures or make tallies to show that 28 pupils divided into 7 groups means that there are 4 in each group.

2. We have learned that to find "how many in a group" we should know the division facts. These are the division facts for 7:

0	1	2	3	4	5	6	7	8	9
7)0	7)7	7)14	7)21	7)28	7)35	7)42	7)49	7)56	7)63

Make practice cards for these facts and study them until you know them all.

3. These are the division facts with 7 as a quotient:

7	7	7	7	7	7	7	7	7
1)7	2)14	3)21	4)28	5)35	6)42	7)49	8)56	9)63

Make practice cards for these facts and study them until you know them all.

4. The division facts for 7 are related to the multiplication facts for 7.

$6 \times 7 = 42 \quad 7 \times 6 = 42 \quad 42 \div 7 = 6 \quad 42 \div 6 = 7$

Write the multiplication and division family for each of these groups of numbers:

a. 7, 2, 14 **c.** 35, 7, 5 **e.** 7, 3, 21
b. 4, 7, 28 **d.** 56, 8, 7 **f.** 63, 7, 9

UNEVEN DIVISION BY SEVEN

You have learned that all numbers cannot be divided evenly. Five pennies cannot be shared by two people so that each has the same number. Each person will get 2 pennies, and there will be 1 penny left over.

Don helped his father gather flowers and put them into bunches. They gathered 54 flowers and put 7 in each bunch. How many bunches did they have? Were there any flowers left over?

Don could have found the answer this way:

$$\begin{array}{r} 54 \\ -7 \\ \hline 47 \end{array} \quad \begin{array}{r} 47 \\ -7 \\ \hline 40 \end{array} \quad \begin{array}{r} 40 \\ -7 \\ \hline 33 \end{array} \quad \begin{array}{r} 33 \\ -7 \\ \hline 26 \end{array} \quad \begin{array}{r} 26 \\ -7 \\ \hline 19 \end{array} \quad \begin{array}{r} 19 \\ -7 \\ \hline 12 \end{array} \quad \begin{array}{r} 12 \\ -7 \\ \hline 5 \end{array}$$

There were 7 bunches of flowers and 5 flowers over.

The easy way is to work this as a division example. Study the example at the right. The quotient is 7 with a remainder of 5.

$$\begin{array}{r} 7 \\ 7\overline{)54} \\ \underline{49} \\ 5 \end{array}$$

We can check this division example this way: $7 \times 7 = 49$. $49 + 5 = 54$. The answer is correct.

1. Copy these numbers and underline the helpers for dividing by 7:

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69

2. When the number we are dividing by 7 is **one larger** than the helper what is the remainder?

3. When the number we are dividing by 7 is **one smaller** than the helper what is the remainder?

4. Which are the numbers that you cannot divide by 7 and have at least a quotient of 1?

5. Subtract the first number in each line from each of the numbers that follow it. Write the answers.

a. 14 from	16	15	20	17	19	18
b. 28 from	29	33	34	30	32	31
c. 21 from	24	26	23	22	27	25
d. 42 from	44	47	46	43	45	48
e. 49 from	55	50	53	54	52	51
f. 35 from	40	36	37	39	41	38
g. 63 from	64	69	65	68	66	67
h. 56 from	61	57	62	58	60	59

6. Divide each of the following by 7:

a. 14	27	37	51	45	11	56
b. 17	19	53	25	31	59	41
c. 26	35	49	64	55	61	67

Time for Practice

Copy these examples and find the answers:

	a	b	c	d	e	f
1.	$7\overline{)21}$	$7\overline{)34}$	$7\overline{)8}$	$7\overline{)28}$	$7\overline{)43}$	$7\overline{)60}$
2.	$7\overline{)69}$	$7\overline{)10}$	$7\overline{)49}$	$7\overline{)24}$	$7\overline{)63}$	$7\overline{)13}$
3.	$7\overline{)57}$	$7\overline{)20}$	$7\overline{)50}$	$7\overline{)38}$	$7\overline{)40}$	$7\overline{)66}$
4.	$7\overline{)15}$	$7\overline{)62}$	$7\overline{)44}$	$7\overline{)9}$	$7\overline{)56}$	$7\overline{)36}$

Writing Roman Numbers

Write the following as Roman numbers:

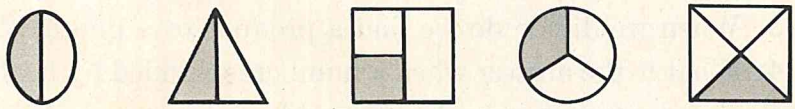
	a	b	c	d	e
1.	13	2	7	20	4
2.	5	18	26	19	30
3.	22	29	23	17	15
4.	24	27	9	28	6

Reviewing Fractions

Write the answers to these questions:

1. What is $\frac{1}{3}$ of 6 pennies?
2. How many are $\frac{1}{2}$ of 8 books?
3. What is $\frac{1}{2}$ of 4 days?
4. How many are $\frac{1}{4}$ of 8 children?
5. What fractional part of each of these figures is shaded?

a b c d e



ADDING WHEN WE CARRY IN MULTIPLICATION

(Review)

The example at the right will help you review carrying in multiplication. When we multiply 28 by 7 we think, "Seven 8's are 56." We write the 6 in the ones' column of the product. We carry the 5 tens. We think, "Seven times 2 tens is 14 tens." We add 5 tens and write 19 tens. The product is 196.

$$\begin{array}{r} 28 \\ 7 \\ \hline 196 \end{array}$$

In the example above we multiplied 2 tens by 7 before we added the 5 tens that were carried.

When we carry in multiplication, we first multiply and then we add the number carried.

Write the answers to the following examples. Be sure to multiply before you add. Do not copy the examples.

	a	b	c
1.	Five 2's + 2	Six 7's + 4	Six 8's + 5
2.	Five 4's + 4	Seven 3's + 5	Four 7's + 2
3.	Six 3's + 3	Five 5's + 4	Seven 6's + 4
4.	Four 3's + 2	Seven 7's + 6	Seven 3's + 6
5.	Five 6's + 4	Five 7's + 3	Six 7's + 5
6.	Six 5's + 4	Four 9's + 1	Five 8's + 2
7.	Five 3's + 2	Six 6's + 5	Six 9's + 5
8.	Four 8's + 2	Seven 4's + 4	Seven 8's + 6

Review Questions

Write the answers to these questions:

1. Which is more, $\frac{1}{2}$ pound of butter or $\frac{1}{4}$ pound of butter?

2. What is the name of the answer in subtraction?

3. When we divide do we find a product or a quotient?

4. What is the answer when a number is divided by itself?

★**5.** Can a number mean less than 1?

MULTIPLICATION TEST

(Carrying without bridging)

Copy these examples and write the products:

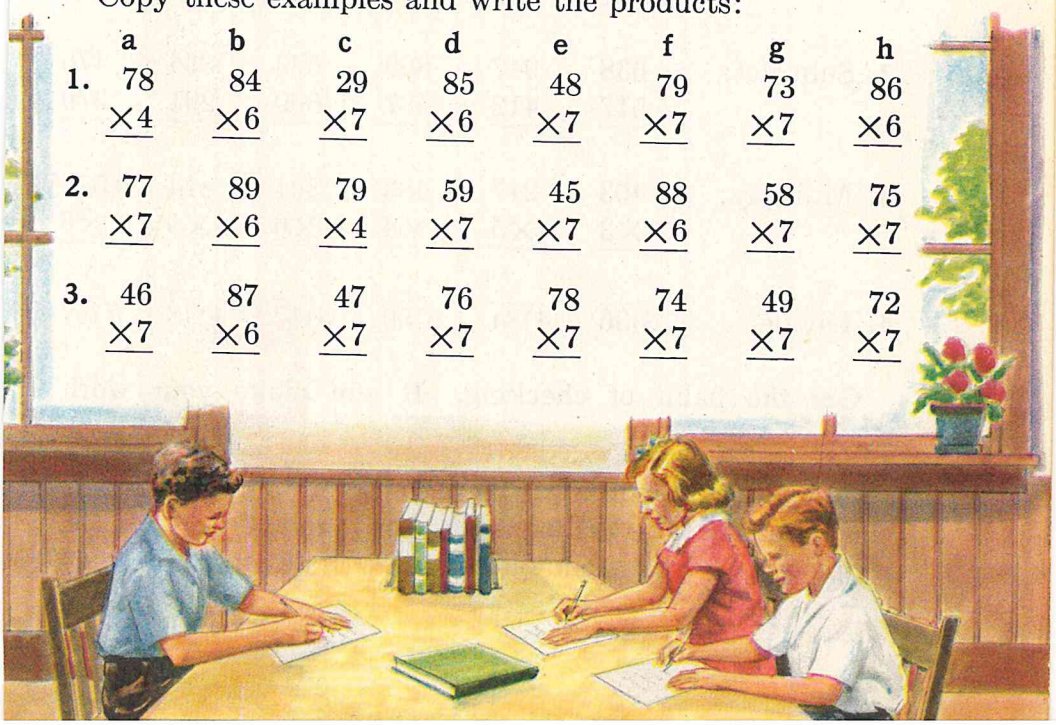
	a	b	c	d	e	f	g	h
1.	22	34	26	65	67	37	64	48
	×5	×4	×5	×6	×4	×5	×6	×4
2.	48	92	99	83	55	84	39	47
	×5	×7	×6	×4	×6	×7	×5	×6
3.	82	53	44	66	83	85	68	52
	×6	×7	×5	×7	×6	×5	×7	×6
4.	12	59	85	96	76	37	69	88
	×7	×4	×7	×4	×6	×7	×7	×5

MULTIPLICATION TEST

(Carrying with bridging)

Copy these examples and write the products:

	a	b	c	d	e	f	g	h
1.	78	84	29	85	48	79	73	86
	×4	×6	×7	×6	×7	×7	×7	×6
2.	77	89	79	59	45	88	58	75
	×7	×6	×4	×7	×7	×6	×7	×7
3.	46	87	47	76	78	74	49	72
	×7	×6	×7	×7	×7	×7	×7	×7



THE HABIT OF CHECKING

Do you always check your work? Make checking your arithmetic a habit. Perhaps you need to review the ways we check our work.

Check addition by adding up after you have added down.

Check subtraction by adding the number subtracted to the remainder. This sum should be the number subtracted from.

Check multiplication by multiplying a second time.

Check division by multiplying the quotient by the number you divide by. If there is a remainder, add the remainder to the product.

Work each set of examples. Check your work.

	a	b	c	d	e	f
1. Add:	604 329	482 347	518 609	277 542	439 483	907 436
2. Subtract:	638 517	947 412	892 437	673 669	354 291	476 279
3. Multiply:	403 ×3	217 ×5	483 ×4	391 ×6	814 ×5	572 ×6
4. Divide:	3)36	4)84	6)50	5)47	4)48	7)57

Get the habit of checking. It will make your work accurate.

5. Make as long a list as you can of ways in which people check things they do or things they use. For example, people who drive automobiles check the air in the tires.

REVIEWING THE FOURS AND FIVES

Copy these examples and write the products:

	a	b	c	d
1.	4×0	4×5	0×4	5×4
2.	4×1	4×6	1×4	6×4
3.	4×2	4×7	2×4	4×4
4.	4×3	4×8	3×4	8×4
5.	4×4	4×9	7×4	9×4

Copy these examples and write the quotients:

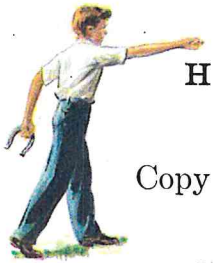
	a	b	c	d	e	f
6.	$4\overline{)8}$	$4\overline{)16}$	$2\overline{)8}$	$4\overline{)36}$	$8\overline{)32}$	$1\overline{)4}$
7.	$4\overline{)4}$	$4\overline{)0}$	$3\overline{)12}$	$4\overline{)12}$	$6\overline{)24}$	$4\overline{)24}$
8.	$4\overline{)20}$	$9\overline{)36}$	$4\overline{)28}$	$4\overline{)32}$	$5\overline{)20}$	$7\overline{)28}$

Copy these examples and write the quotients:

	a	b	c	d	e	f
9.	$5\overline{)20}$	$5\overline{)45}$	$2\overline{)10}$	$5\overline{)40}$	$6\overline{)30}$	$5\overline{)15}$
10.	$5\overline{)35}$	$1\overline{)5}$	$5\overline{)5}$	$7\overline{)35}$	$5\overline{)10}$	$5\overline{)0}$
11.	$3\overline{)15}$	$5\overline{)25}$	$4\overline{)20}$	$5\overline{)30}$	$8\overline{)40}$	$9\overline{)45}$

Copy these facts and write the missing numbers:

	a	b	c
12.	$5 \times ? = 5$	$4 \times ? = 36$	$5 \times 0 = ?$
13.	$4 \times ? = 0$	$? \times 5 = 40$	$4 \times ? = 16$
14.	$? \times 4 = 20$	$4 \times 8 = ?$	$? \times 5 = 45$
15.	$? \times 5 = 35$	$5 \times ? = 15$	$1 \times ? = 5$
16.	$4 \times ? = 28$	$6 \times ? = 24$	$7 \times ? = 28$
17.	$25 \div 5 = ?$	$36 \div ? = 9$	$? \div 5 = 8$
18.	$15 \div ? = 5$	$25 \div ? = 5$	$10 \div ? = 2$
19.	$16 \div ? = 4$	$28 \div ? = 4$	$? \div 4 = 8$
20.	$24 \div 6 = ?$	$? \div 5 = 9$	$? \div 5 = 6$
21.	$8 \div 2 = ?$	$? \div 4 = 7$	$12 \div ? = 4$



HOW MUCH HAVE YOU LEARNED?

(Chapter Test 4)

Copy these examples and write the answers:

	a	b	c	d
1.	6×5	8×7	$30 \div 6$	$49 \div 7$
2.	7×3	6×8	$21 \div 7$	$18 \div 6$
3.	7×6	5×7	$42 \div 7$	$54 \div 6$
4.	7×9	6×4	$42 \div 6$	$56 \div 7$
5.	9×6	6×6	$7 \div 7$	$48 \div 6$

	a	b	c	d	e
6.	$6\overline{)13}$	$7\overline{)39}$	$7\overline{)22}$	$6\overline{)49}$	$7\overline{)59}$
7.	$7\overline{)50}$	$6\overline{)25}$	$7\overline{)16}$	$6\overline{)56}$	$6\overline{)37}$
8.	$\begin{array}{r}51\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}28\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}56\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}53\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}60\\ \times 6\\ \hline\end{array}$
9.	$\begin{array}{r}40\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}48\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}91\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}27\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}37\\ \times 7\\ \hline\end{array}$
10.	$\begin{array}{r}84\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}58\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}73\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}69\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}46\\ \times 7\\ \hline\end{array}$
11.	$\begin{array}{r}46\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}88\\ \times 6\\ \hline\end{array}$	$\begin{array}{r}79\\ \times 4\\ \hline\end{array}$	$\begin{array}{r}59\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}89\\ \times 6\\ \hline\end{array}$

Write the answers to the following:

12. How many pints are there in one quart?

13. How many pints are there in two quarts?

14. How many quarts are there in two gallons?

15. How many ounces are there in a pound?

16. When we buy cheese we ask for it by the —?—.

17. When we buy gasoline we ask for it by the —?—.

18. The dot in the dollars and cents number $4.13 is called a —?—.

Write the following as Arabic numbers:

	a	b	c
19.	XVI	XXX	VII
20.	IX	XII	XXI
21.	VIII	XXIX	XIV

Write the following as Roman numbers:

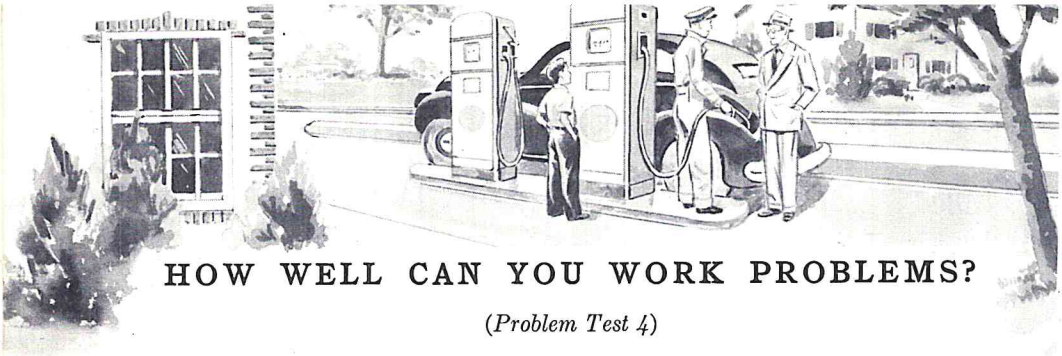
	a	b	c
22.	7	20	15
23.	30	9	22
24.	19	13	14

IMPROVE YOUR SKILLS

(Diagnostic Test 3)

Work each set of examples. If you miss more than one example in any set, you need to review. The page number printed in heavier figures after the set tells you which page to review.

	a	b	c		d	e	f
1.	38	47	93 (**15**)	2.	431	567	$4.93 (**23**)
	+16	+58	+27		−120	−562	−1.71
3.	416	834	758 (**26**)	4.	3)63	2)48	3)39 (**48**)
	−377	−285	−379				
5.	420	607	813 (**50**)	6.	5)38	3)19	4)34 (**74**)
	×2	×3	×3				



HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 4)

Work these problems. Show all your work on your paper.

1. It is seven blocks from Kay's home to her school. Kay walks this distance four times each day. How many blocks does she walk to and from school each day?

2. If Joe bought two quarts of ice cream, how many pints did he buy?

3. Don's father bought 6 gallons of gasoline, which cost 24¢ a gallon. How much did the 6 gallons cost?

4. How many quarts of gasoline did Don's father buy?

5. Martha's father had their coal bin filled. The bin held 7 tons and the coal cost $19 a ton. How much did the 7 tons of coal cost?

6. How much will 7 yards of cloth cost if it sells for 36¢ a yard?

7. How many pies will it take to serve 48 people if each pie is cut into 6 pieces?

8. Alfred had 58 marbles. He divided them into as many groups of 7 as he could. How many groups of 7 did he have? How many marbles were left over?

9. Ruth counted her dominoes. There were 64. She used as many of the dominoes as she could to make 7 equal stacks. How many dominoes were there in each stack? Were there any dominoes left over? How many?

DO YOU LEARN AND REMEMBER?

(Progress Test 3)

Copy these examples and write the answers:

	a	b	c	d
1.	9 2 7 4	4 8 6 5	6)32	7)48
2.	$5.37 −1.27	569 +425	$4.00 −2.00	$2.89 +1.98
3.	38 ×6	50 ×7	47 ×7	69 ×4
4.	92 ×5	11 ×6	87 ×5	38 ×4
5.	6)66	5)41	3)369	6)16

THIS IS DIFFERENT

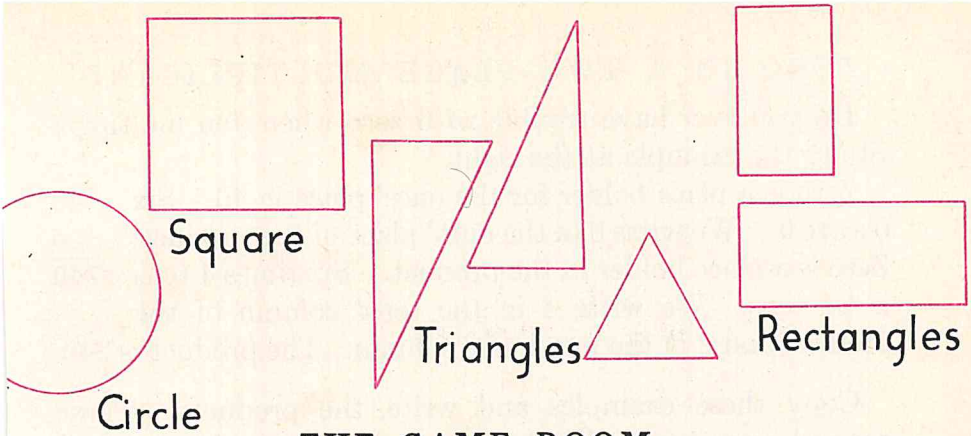
(Enrichment material)

What number must be placed where the question mark (?) is to make the sum of each of these addition examples correct?

a	b	c	d	e	f	g
6	8	?	5	9	8	?
7	9	3	8	2	?	6
3	?	8	?	9	8	7
?	4	2	6	?	8	9
21	28	17	19	29	32	30

CHAPTER V

More Multiplying and Dividing



THE GAME ROOM

Billy and Jane had a game room in their basement. Billy and Jane and their friends often played there.

1. See how many **circles** or parts of circles you can find in the picture of their game room on the other page.

2. See how many **squares** you can find in the game room. Each side of a square is the same length and the corners are all alike. We say that the corners are square.

3. See how many **triangles** you can find in the game room. A triangle has three sides.

4. See how many **rectangles** you can find in the game room. A rectangle has four sides. The sides across from each other are the same length and the corners are square. A square is a rectangle, but not all rectangles are squares.

5. Find as many objects as you can in your schoolroom that have the shape of circles, squares, triangles, or rectangles.

6. Make a list of objects in your home that have the shape of circles, squares, triangles, or rectangles.

★**7.** Make up five problems that use the numbers on the game boards. Write these problems and show your work in finding the answers to them.

ZERO IN A TWO-PLACE MULTIPLICAND

Do you ever have trouble with zero when you multiply? Study the example at the right.

Zero is a place holder for the ones' place in 40. Six 0's are 0. We write 0 in the ones' place of the product. Zero is a place holder in the product. Six times 4 tens is 24 tens. We write 4 in the tens' column of the product and 2 in the hundreds' column. The product is 240.

$$\begin{array}{r} 40 \\ \times 6 \\ \hline 240 \end{array}$$

Copy these examples and write the products. These examples are easy. Work fast.

	a	b	c	d	e	f	g	h	i	j
1.	10	22	21	14	12	33	42	31	11	13
	×3	×2	×3	×2	×4	×2	×2	×2	×3	×2
2.	10	20	31	32	10	23	10	30	10	10
	×7	×4	×3	×2	×2	×3	×6	×3	×4	×5

Copy these examples and write the products. These examples are like the examples you have just done except that there will be a figure in the hundreds' place in the product.

	a	b	c	d	e	f	g	h	i	j
3.	50	60	51	64	43	70	71	62	83	90
	×2	×4	×2	×2	×3	×6	×5	×4	×2	×7
4.	50	90	71	82	63	94	72	60	70	74
	×7	×5	×4	×3	×3	×2	×2	×6	×7	×2
5.	92	70	81	91	80	50	73	92	84	61
	×3	×3	×7	×6	×7	×5	×2	×4	×2	×7

CARRYING WITH TWO-PLACE MULTIPLICANDS

(Review)

Study the example below. It shows you again how to carry when there is a two-place multiplicand.

29 =	2 tens	9 ones	29
×3 =	×3	×3	×3
	6 tens	27 ones = 87	87

When we multiply and have more than 9 in the ones' column, we carry the number of tens to be added to the tens' column.

Copy these examples and write the products. Check by going over your work a second time. These examples are easy. Work fast.

	a	b	c	d	e	f	g	h	i	j
1.	15	14	16	19	39	13	36	47	13	12
	×2	×3	×4	×3	×2	×5	×2	×2	×4	×6
2.	27	14	18	24	28	13	14	17	12	46
	×3	×6	×5	×3	×3	×6	×7	×5	×8	×2

Copy these examples and write the products. In this set there will be a figure in the hundreds' place of the product. Work carefully.

	a	b	c	d	e	f	g	h	i	j
3.	25	36	48	57	38	79	68	85	94	88
	×6	×4	×3	×6	×7	×2	×4	×7	×3	×5
4.	96	83	75	67	46	97	73	77	42	39
	×7	×5	×6	×7	×6	×6	×4	×5	×7	×7

HOW NUMBER PROCESSES ARE RELATED

Philip and Will showed the pupils of their class how number processes are related.

Addition, subtraction, multiplication, and division are number processes.

This is what Philip wrote to show that the processes of multiplication and addition are related:

$3 \times 4 = 12$ **and** $4 \times 3 = 12$

3×4 **means** $4 + 4 + 4$

4×3 **means** $3 + 3 + 3 + 3$

$4 + 4 + 4 = 3 + 3 + 3 + 3$

1. Add $4 + 4 + 4$ and $3 + 3 + 3 + 3$ and see if Philip was right.

Will said: "This shows how division and subtraction are related:

$$12 \div 4 = 3$$

"Twelve divided by 4 tells how many times 4 can be subtracted from 12 before 12 is used up.

$$12 - 4 = 8 \qquad 8 - 4 = 4 \qquad 4 - 4 = 0$$

"We can subtract three 4's from 12."

Philip then said: "We have learned that $12 \div 4$ and 3×4 are related. Then addition, subtraction, multiplication, and division are all related."

2. Show how the following are related:

a. 3×7 $\quad 21 \div 7$ $\quad 7 + 7 + 7$

b. 3×3 $\quad 9 \div 3$ $\quad 3 + 3 + 3$

c. 5×4 $\quad 20 \div 4$ $\quad 20 \div 5$ $\quad 4 \times 5$

d. 2×8 $\quad 16 \div 8$ $\quad 8 + 8$ $\quad 16 \div 2$

3. Tell how we use addition to check subtraction.

4. Tell how we use multiplication to check division.

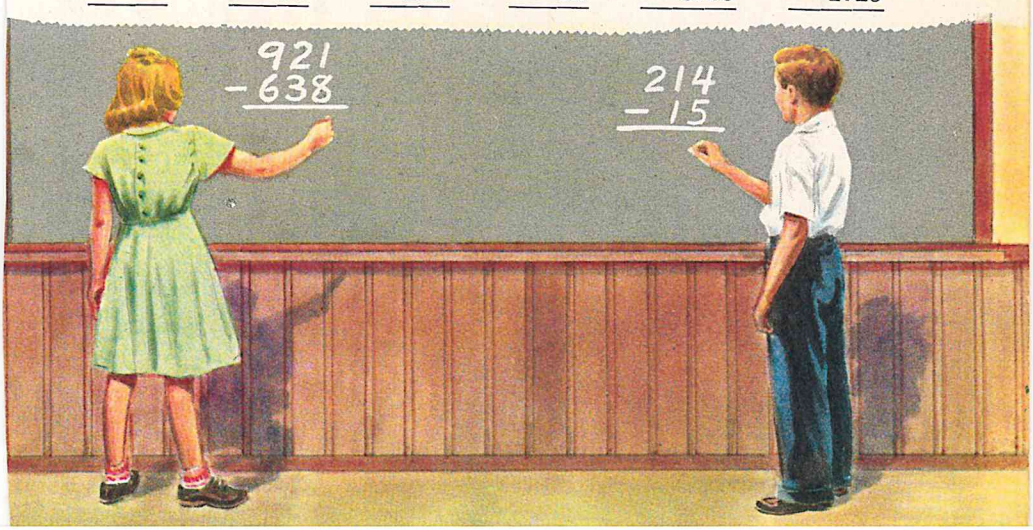
Time for Practice

Copy these examples and find the sums:

	a	b	c	d	e	f	g	h
1.	1	7	4	3	9	2	7	6
	4	2	8	9	1	7	5	2
	8	9	8	9	1	4	7	7
	7	1	7	9	8	9	5	1
2.	2	5	6	3	8	9	5	4
	6	8	4	1	3	4	4	7
	9	8	7	9	9	8	7	6
	2	5	3	9	6	5	6	7

Copy these examples and find the differences:

	a	b	c	d	e	f
3.	832	921	478	629	$5.47	$1.19
	−517	−638	−198	−317	−.49	−.40
4.	489	517	811	148	$2.77	$8.73
	−265	−508	−309	−59	−1.68	−.88
5.	736	287	684	214	$7.99	$3.58
	−58	−95	−349	−15	−6.15	−1.49



Without Paper and Pencil

When we multiply and carry we must be sure of our addition. Practice the following addition. It will help you with your multiplication. Say the answers.

	a	b	c	d	e
1.	18 + 2	48 + 3	28 + 2	48 + 4	28 + 5
2.	18 + 3	36 + 5	56 + 4	28 + 3	14 + 6
3.	56 + 5	28 + 6	24 + 6	56 + 6	18 + 5
4.	48 + 2	36 + 4	48 + 5	28 + 4	16 + 4
5.	48 + 7	24 + 4	18 + 8	56 + 3	16 + 8

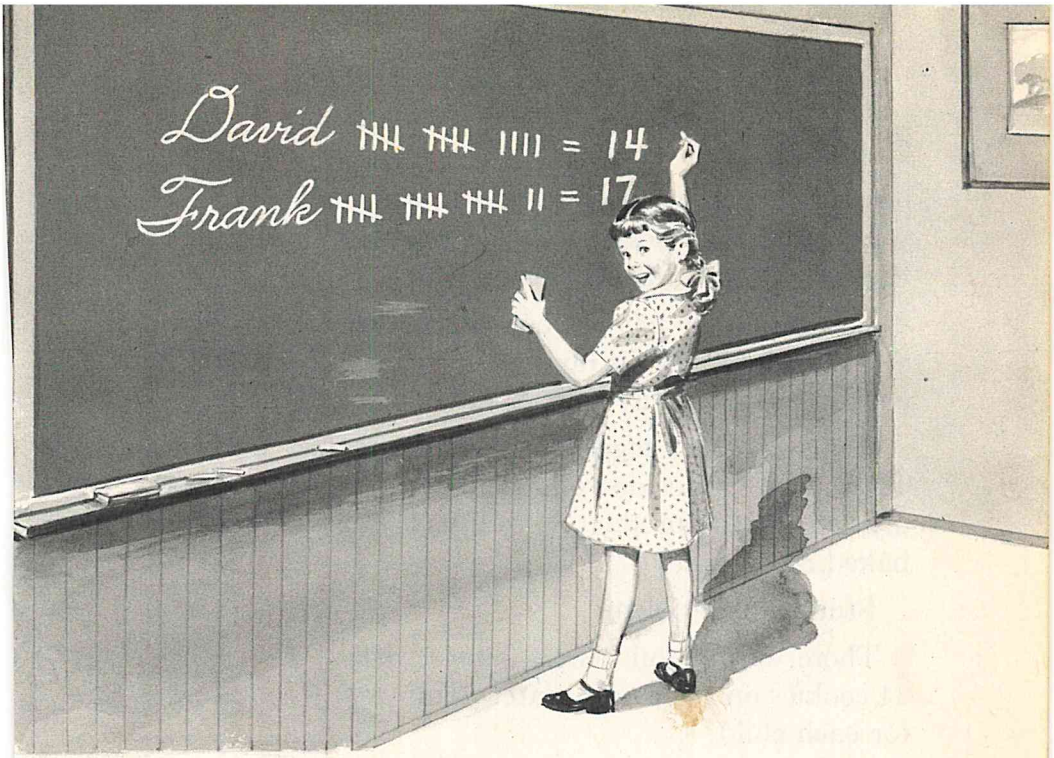
Practice the following subtraction. Say the answers.

	a	b	c	d	e
6.	14 − 7	18 − 2	11 − 4	24 − 3	19 − 5
7.	34 − 2	53 − 1	60 − 5	17 − 4	27 − 8
8.	47 − 7	19 − 9	38 − 6	68 − 3	20 − 8
9.	52 − 5	30 − 9	45 − 7	72 − 6	56 − 8

Time for Practice

Copy these examples and write the products. Go over your work. Be sure that you have added correctly the number carried.

	a	b	c	d	e	f	g	h	i	j
1.	67	46	88	78	37	68	69	75	44	89
	×3	×7	×6	×4	×6	×6	×3	×4	×7	×6
2.	79	35	29	87	77	67	49	36	68	84
	×4	×6	×7	×7	×4	×6	×7	×6	×3	×6
3.	88	86	76	45	38	87	59	34	85	58
	×7	×6	×4	×7	×6	×6	×7	×6	×6	×7



TALLYING

The pupils in Miss Hill's room at Taylor School elected a class president. David and Frank were the two pupils for whom the pupils voted. As the votes were counted, Elsie **tallied** them on the blackboard. The picture above shows how the tallies looked.

Each tally stands for one. We group the tallies by 5 in order to count them easily. Study the picture to see how the tallies can be counted by 5.

1. Tally the number of pupils in each row in your schoolroom.

2. Tally the number of boys and the number of girls who pass through one schoolhouse door at noon.

3. Tally the number of cars that pass the school going in each direction in fifteen minutes.

WORDS HELP US

(Deciding whether to multiply or divide)

As you know, there are certain words in problems that help us decide whether to add or to subtract. There are words that also help us decide whether to multiply or to divide. Study this problem:

Jane's mother baked cookies for Jane's birthday party. She baked 14 cookies on a cooky pan and baked 6 pans of cookies. How many cookies did she bake **all together?**

The words **all together** help us in this problem. They help us decide to multiply. When we multiply 6 × 14, the product 84 tells us that Jane's mother baked 84 cookies.

$$\begin{array}{r} 14 \\ \times 6 \\ \hline 84 \end{array}$$

Study this problem:

There were 6 children at Jane's party. Her mother put 24 cookies on the cooky plate. How many cookies was this for **each** child?

The word **each** is the word that helps us. It helps us decide to divide. We divide 24 by 6 and find that the quotient is 4. There were 4 cookies for each child.

$$\begin{array}{r} 4 \\ \overline{6)24} \end{array}$$

Work these problems. Show all your work on your paper.

1. John's father bought 6 new golf balls. They cost 75¢ each. How much did the 6 golf balls cost all together?

2. Ruth's teacher has given Ruth 30 sheets of colored paper for the pupils in her row. There are 6 pupils in her row. How many sheets of paper should Ruth give each pupil if each is to have the same number?

3. Don worked 4 days helping a neighbor plant a garden. He was paid $1.50 for each day he worked. How much did he earn in 4 days?

4. Don had 66 tulip bulbs to plant. They had to be planted in 6 equal rows. How many bulbs should Don plant in each row?

5. In getting ready for a school party the pupils cut small pumpkins from orange paper. They cut 6 from each sheet of paper. How many pumpkins could be cut from 24 sheets?

6. Forty of the pumpkins were pasted on the windows as a decoration. There were the same number of pumpkins on each of 5 windows. How many pumpkins were there on each window?

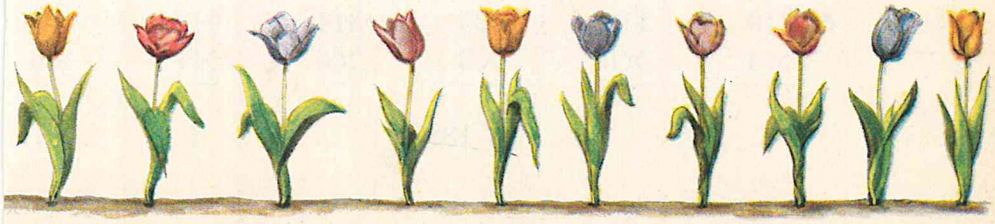
Do It Quickly

Write the answers to these examples without copying the examples. Think each answer. Then write it.

	a	b	c	d
1.	$17 + 6$	5×8	$20 \div 4$	$10 - 10$
2.	6×7	$24 + 9$	$37 - 5$	$42 \div 7$
3.	$14 \div 2$	7×0	$53 + 0$	$67 + 9$
4.	$18 - 8$	$40 - 6$	8×0	$13 - 7$
5.	$43 + 5$	7×3	$5 \div 5$	$36 \div 4$
6.	$19 - 2$	$47 \div 6$	$18 - 16$	$64 - 8$
7.	4×9	$8 - 8$	$12 \div 2$	$19 + 9$
8.	$6 - 4$	$32 - 9$	$48 + 8$	$7 \div 1$

A Puzzle Problem

★ The picture below shows the first row of tulips that Don planted. The tulips were planted 5 inches apart. How long was the row? Why is this a puzzle problem?



CARRYING ONCE WITH THREE-PLACE MULTIPLICANDS

Study the example below. It shows you how to carry from the ones' column to the tens' column when there is a three-place multiplicand.

314 =	3 hundreds	1 ten	4 ones		**314**
×6 =	×6	×6	×6		**×6**
	18 hundreds	6 tens	24 ones	= 1884	**1884**

Copy these examples and write the products. Be sure to check your work by going over it.

	a	b	c	d	e	f
1.	113	412	111	511	212	611
	×3	×4	×7	×6	×4	×5
2.	212	113	716	814	613	417
	×5	×7	×6	×6	×7	×5
3.	427	318	514	415	618	813
	×3	×4	×7	×6	×5	×7

These are for extra practice:

4.	216	113	318	513	215	515
	×3	×4	×5	×7	×6	×6
5.	224	614	217	713	416	623
	×3	×7	×5	×7	×6	×4
6.	316	119	325	314	412	113
	×4	×5	×3	×6	×7	×6

ZERO IN A THREE-PLACE MULTIPLICAND

We have learned that we sometimes have a zero in a two-place multiplicand. Study the following example. It shows you how to multiply when you have a zero in a three-place multiplicand.

607 =	6 hundreds	0 tens	7 ones		**607**
×5	×5	×5	×5		**×5**
	30 hundreds	0 tens	35 ones	= 3035	**3035**

Five times 7 is 35. Write the 5 ones. Carry the 3 tens. Five times 0 tens is 0 tens. Zero tens and the carried 3 tens are 3 tens. Write 3 in the tens' place. Five times 6 hundreds is 30 hundreds. Write the 30 hundreds in the hundreds' and thousands' places. The product is 3035.

Copy these examples and write the products:

	a	b	c	d	e	f
1.	308	206	307	420	606	408
	×2	×4	×5	×7	×6	×5
2.	880	708	307	380	509	509
	×3	×6	×7	×4	×7	×6

There are no zeros in the multiplicands below. But in some examples you must carry to the tens' place. In others you must carry to the hundreds' place.

	a	b	c	d	e	f
3.	162	142	316	514	341	241
	×4	×3	×5	×7	×6	×5
4.	831	261	324	627	716	181
	×6	×7	×4	×3	×6	×7

5. Which number in a multiplication example is the multiplier? the product? the multiplicand?

CARRYING TWICE WITH THREE-PLACE MULTIPLICANDS

Sometime when we work multiplication examples we have to carry to both the tens' and hundreds' places. Study the following example. This example shows you how to carry twice when you have a three-place multiplicand.

476 =	4 hundreds	7 tens	6 ones		**476**
×4	×4	×4	×4		**×4**
	16 hundreds	28 tens	24 ones	= 1904	**1904**

Four 6's are 24. Write the 4 ones and carry the 2 tens to the tens' place. Four 7's are 28, and the 2 tens carried make 30. Write 0 in the tens' place and carry 3 hundreds to the hundreds' place. Four 4's are 16 and the 3 hundreds carried make 19. Write 9 in the hundreds' place and 1 in the thousands' place. The product is 1904.

Copy these examples and write the products. Check your work by going over it carefully.

	a	b	c	d	e	f
1.	134	225	364	168	579	267
	×4	×6	×5	×3	×2	×4
2.	475	637	892	294	826	497
	×6	×7	×5	×7	×6	×4
3.	457	384	458	245	362	492
	×5	×6	×7	×6	×7	×6
4.	326	435	549	648	387	417
	×4	×7	×6	×7	×5	×6

MULTIPLYING MONEY NUMBERS

(Carrying once or twice)

Sometimes we multiply a money number that is less than one dollar. We can multiply such a number in this way:

23¢		$.23
×4	or	×4
92¢		$.92

We often have a multiplication example like this:

$.75
×3
$2.25

When we multiply a money number that is more than a dollar we multiply in this way:

$6.03
×4
$24.12

Always put the decimal point in the correct place.

Copy these examples and multiply:

	a	b	c	d	e
1.	$3.07	$6.19	$2.00	$5.15	$.83
	×5	×4	×7	×6	×4
2.	$9.20	$.99	$1.46	$4.37	$8.30
	×7	×3	×5	×6	×7

Time for Practice

Copy these examples and write the answers:

	a	b	c	d	e
1.	819	$6.40	$4.21	3)69	$8.40
	+437	−2.06	×5		×7
2.	514	$2.70	800	$2.43	6)49
	×6	+6.39	−500	×4	
3.	479	$6.59	$.08	768	$7.52
	+ 67	×5	+.05	−289	×7

SHALL WE ADD OR MULTIPLY?

We add or multiply when groups are combined or put together. Sometimes the words in problems that help us decide what to do mean to add. Sometimes the same words mean to multiply. We have to think about other facts in the problem to know which to do.

We add when we put together or combine groups of different sizes.

We multiply when we put together or combine groups that are all the same size.

Work these problems. Show all your work on your paper.

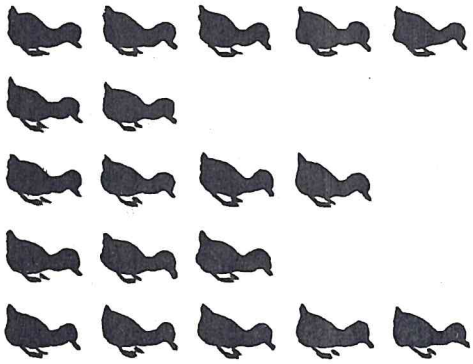
1. The pupils in Miss Young's room bought a present for a pupil who was sick. There were 27 pupils and each brought 5¢. How much money did they have for the present?

2. How much money would the class have had if each pupil had brought 7¢?

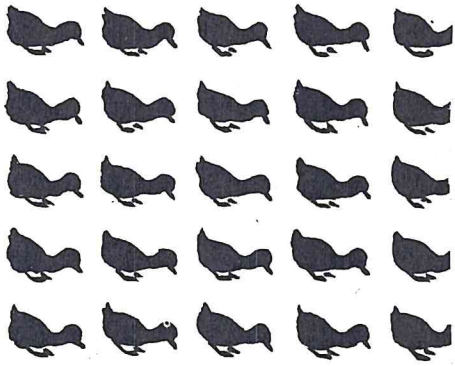
3. Bob worked four afternoons after school. These are the amounts he earned: 60¢, 55¢, 90¢, and 75¢. How much did he earn all together?

4. The next week Bob worked 5 afternoons and earned 65¢ each afternoon. How much did he earn in all 5 afternoons?

Add



Multiply



EVEN DIVISION OF TWO-PLACE NUMBERS

(Review)

Jane and Helen cut pictures from old magazines for their scrapbooks. When they had finished they found that they had 48 pictures. They shared them equally. How many pictures did each girl get?

To divide 48 by 2, we first divide the 4 tens by 2. Four tens divided by 2 equals 2 tens. We write the 2 directly above the 4 tens because we divided the tens and we want the 2 in the tens' place in the quotient. Now we divide 8 ones by 2. $8 \div 2 = 4$. We write the 4 directly above the 8. The quotient is 24.

$$\begin{array}{r} 24 \\ 2\overline{)48} \end{array}$$

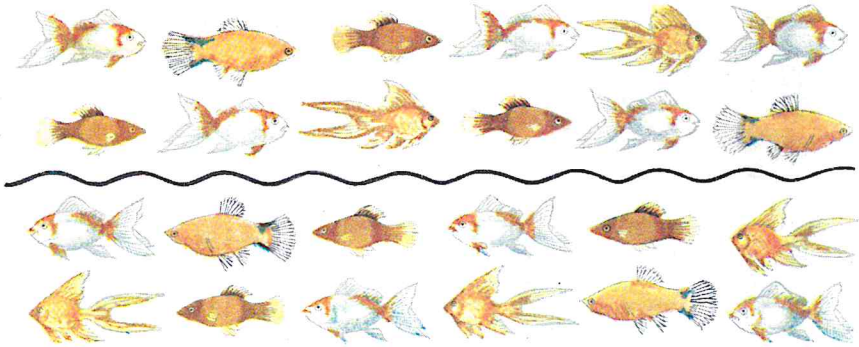
Check

$$\begin{array}{r} 24 \\ \times 2 \\ \hline 48 \end{array}$$

We check our answer by multiplying 24 by 2. The product is 48. The answer checks.

Copy these examples and write the quotients:

	a	b	c	d	e	f
1.	$3\overline{)36}$	$4\overline{)48}$	$3\overline{)63}$	$2\overline{)46}$	$3\overline{)93}$	$4\overline{)88}$
2.	$6\overline{)66}$	$2\overline{)64}$	$3\overline{)66}$	$2\overline{)82}$	$4\overline{)84}$	$5\overline{)55}$
3.	$2\overline{)68}$	$3\overline{)69}$	$2\overline{)84}$	$4\overline{)44}$	$2\overline{)62}$	$3\overline{)39}$
4.	$3\overline{)33}$	$3\overline{)96}$	$2\overline{)42}$	$3\overline{)99}$	$2\overline{)86}$	$7\overline{)77}$



DIVIDING SOME GOLDFISH

(Fractions in division)

Richard had 24 goldfish in the pool in his yard. He decided to sell $\frac{1}{2}$ of them. How many goldfish did Richard sell?

Do you remember that, to find a fractional part of a number, we must divide? To answer the question in the problem above, we must divide 24 by 2.

Look at the example at the right. How much is $\frac{1}{2}$ of 2 tens? It is 1 ten; so we write 1 in the tens' place of the quotient. What is $\frac{1}{2}$ of 4 ones? It is 2 ones; so we write 2 in the ones' place of the quotient. $\frac{1}{2}$ of 24 is 12.

$$\begin{array}{r} \mathbf{12} \\ \mathbf{2)\overline{24}} \end{array}$$

Richard sold 12 goldfish.

Division and fractions are related.

When we need to find a fractional part of a number, we can divide to find out how much the fractional part is.

Copy these examples and write the answers. Your work should look this way: $\frac{1}{3}$ of 12 $\quad \begin{array}{r} 4 \\ 3\overline{)12} \end{array} \quad$ $\frac{1}{3}$ of 12 is 4.

1. $\frac{1}{2}$ of 10	**5.** $\frac{1}{2}$ of 42	**9.** $\frac{1}{2}$ of 46
2. $\frac{1}{4}$ of 8	**6.** $\frac{1}{3}$ of 36	**10.** $\frac{1}{3}$ of 39
3. $\frac{1}{2}$ of 26	**7.** $\frac{1}{4}$ of 44	**11.** $\frac{1}{4}$ of 48
4. $\frac{1}{3}$ of 18	**8.** $\frac{1}{2}$ of 22	**12.** $\frac{1}{2}$ of 86

WRITING DIVISION EXAMPLES IN ANOTHER WAY

We can write division examples in two ways when we work them. Suppose that we have the example 96 ÷ 3.

We have learned to write the example in this way:

How many 3's are there in 9 tens? There are 3 tens. We write 3 in the tens' place in the quotient. How many 3's are there in 6 ones? There are 2. We write 2 in the ones' place in the quotient. The quotient is 32.

A

```
 32
3)96
```

Check

We multiply the quotient 32 by 3 to check our answer. 3 × 32 = 96. Our answer checks.

```
 32
 ×3
 --
 96
```

B

Here is another way to write the example. When we write the example in this way we check as we work.

```
  3
3)96
  9
  -
```

First, we find the 3's in 9 and write 3 in the tens' place of the quotient. Then we multiply the 3 tens by 3. The product is 9. We write 9 under the 9 tens in 96.

```
  32
3)96
  9
  -
  6
  6
  -
```

Second, we bring down the 6 ones. How many 3's are there in the 6 ones? There are 2; so we write 2 in the ones' place of the quotient. Then we multiply the 2 ones by 3. The product is 6. We write 6 under the 6 that we brought down. The quotient is 32 and there is no remainder.

It is correct to write our division example in either way. The second way keeps our work accurate. After we are sure that our work in division is accurate we can write our examples in the first way to save time.

It is more important to be accurate than to save time!

Copy these examples and find the quotients. Write your work as it is done in Example **B** on page 145.

	a	b	c	d	e
1.	2)42	4)44	2)66	2)86	2)44
2.	3)39	2)68	2)84	4)84	3)36
3.	5)55	3)69	3)99	3)33	2)48

EVEN DIVISION OF THREE-PLACE NUMBERS

(Working the example in the new way)

We can divide three-place numbers in the new way that we have just learned for two-place numbers.

Divide 129 by 3.

First, we divide 12 by 3. We know that we must divide 12 by 3 because we cannot divide 1 by 3. We write the quotient 4 directly above the 2. Second, we divide the 9 by 3. We write the quotient 3 directly above the 9. The quotient of 129 ÷ 3 is 43.

A

```
    43
3)129
Check
    43
   ×3
   129
```

B

```
    43
3)129
   12
    9
    9
```

Tell why we write the 4 directly above the 2 and the 3 directly above the 9.

Copy these examples and find the quotients. Write your work as it is done in Example **B** on this page.

	a	b	c	d	e	f
1.	3)156	4)168	3)189	3)123	4)248	5)305
2.	5)155	6)426	4)124	5)105	4)284	7)147
3.	6)366	7)217	6)186	4)288	6)246	7)427

READING AND WRITING LARGER NUMBERS

(Five-place numbers)

You have already learned to read numbers that have a figure in the thousands' place. Read these numbers:

	a	b	c	d
1.	4892	9520	507	5300
2.	604	8076	2070	7439

How many figures are there in the numbers that you have just read? Can you read a number with five figures?

Here is a five-place number: 17,648

We read this number **seventeen thousand, six hundred forty-eight.** The 1 is in the **ten thousands'** place. We read it and the figure in the thousands' place together as thousands.

Read this number: 34,197

Did you say this? thirty-four thousand, one hundred ninety-seven

3. Read these numbers:

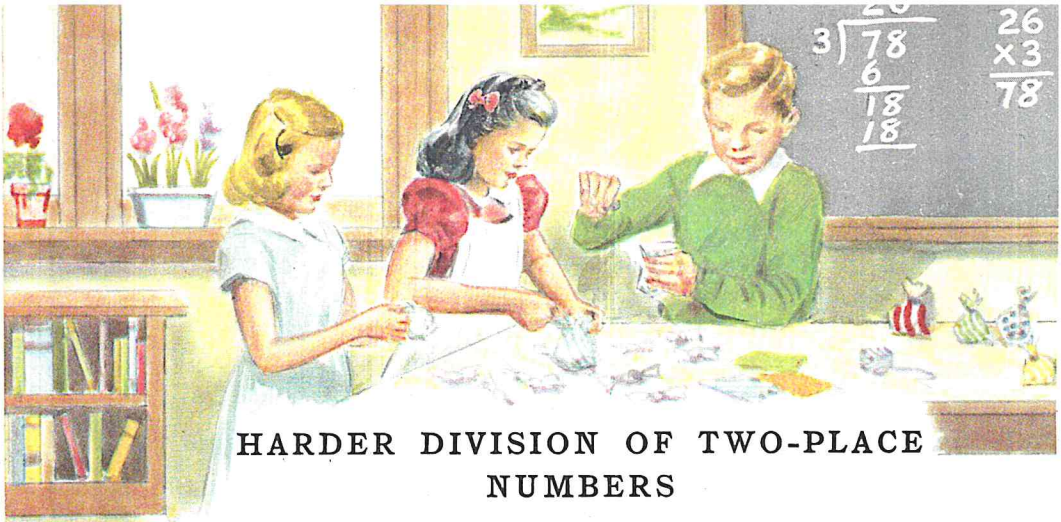
a. 47,518	c. 38,107	e. 29,202
b. 63,249	d. 72,419	f. 83,057

4. Write these numbers, using words:

a. 804	c. 16,407	e. 519
b. 1063	d. 7409	f. 28,540

5. Write these numbers, using figures:

a. Seven thousand ten
b. Six hundred seven
c. Seven hundred sixty-four
d. Twenty-eight thousand five
e. Nineteen thousand
f. Eleven thousand two
g. Five thousand, five hundred
h. Seven hundred eighty



HARDER DIVISION OF TWO-PLACE NUMBERS

The children in Miss Clark's room bought candy to put in bags for a Christmas treat. They had 78 pieces of candy and wished to put 3 pieces in each bag. How many bags could they fill?

This is a division problem. We must divide 78 by 3. We have not had a division example like this before. Let us study the example carefully.

```
   26
3)78
   6
   18
   18
```

These are the steps in this kind of division example:

1. Divide. How many 3's are there in 7 tens? There are 2. Write 2 directly above the 7, because this part of our quotient is 2 tens.

```
   2
3)78
```

2. Multiply. Multiply the 2 tens by 3. Three 2's are 6. We write the 6 tens under the 7 tens.

```
   2
3)78
   6
```

3. Subtract and compare. Subtract the 6 tens from 7 tens. There is a remainder of 1 ten. Is this remainder smaller than the 3? 1 is less than 3; so our work so far is probably right.

```
   2
3)78
   6
   1
```

4. Bring down. Write the 8 ones beside the 1 ten. This is 18 ones, which we must now divide by 3. We start our steps again.

```
   2
3)78
   6
  --
  18
```

1. Divide. How many 3's are there in 18? There are 6. This is 6 ones; so we write 6 in the ones' place in the quotient.

```
   26
3)78
   6
  --
  18
```

2. Multiply. Multiply the 6 ones by 3. The product is 18. Write the product 18 directly below the first 18.

```
   26
3)78
   6
  --
  18
  18
  --
```

3. Subtract and compare. Subtract 18 from 18. The remainder is 0; so we do not write anything. There is nothing to compare because there is no remainder.

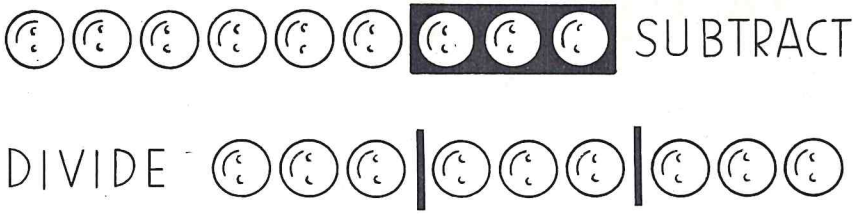
The quotient is 26. The children could fill 26 bags with the 78 pieces of candy.

Does the answer check? $3 \times 26 = 78$. The answer is correct.

```
 26
×3
--
78
```

Copy these examples and find the quotients:

	a	b	c	d	e	f
1.	3)45	4)92	5)65	3)51	6)72	7)84
2.	3)72	4)96	6)84	7)91	5)75	6)90
3.	2)36	5)95	7)98	4)76	2)54	3)84
4.	5)85	2)72	6)78	3)87	6)96	4)68



SHALL WE SUBTRACT OR DIVIDE?

We subtract or divide when groups are taken apart or made into smaller groups. When groups are taken apart or made into smaller groups we get smaller numbers.

We subtract when we take part of a group away.

We divide when we make a larger group into smaller groups, all of the same size.

Work these problems. Show all your work on your paper.

1. Clifford earned $1.20 delivering papers 6 days. His mother asked him how much he earned each day. If he earned the same amount each day, what should he answer?

2. Tom had 53 marbles. Twenty-eight of them were small marbles. The others were larger. How many of the larger marbles did Tom have?

3. May's tablet had 35 pages. She used 5 pages each day. How many days would her tablet last if she used the same number of pages each day?

4. At the beginning of the school year Sarah bought 50 sheets of drawing paper. When she later counted her drawing paper she had 17 sheets of paper. How many sheets of drawing paper had Sarah used?

★**5.** If Sarah had been using 3 sheets of paper each week, how many weeks of the school year had passed? (Hint: You must use the answer in Problem **4** to help you work this problem.)

HARDER DIVISION OF THREE-PLACE NUMBERS

We have learned that sometimes, when we divide, we have an example in which the tens' number cannot be divided evenly. The example at the right will help us know more about this kind of example.

```
   49
4)196
   16
   --
    36
    36
    --
```

We cannot divide 19 by 4 evenly. We think of the next smaller number that we can divide by 4 evenly. It is 16. There are four 4's in 16. Write 4 above the 9. Multiply 4 by 4. Write 16 below the 19. Subtract and compare. The difference is 3, which is less than 4. Bring down the 6. How many 4's are there in 36? There are 9. Write 9 above the 6. Multiply 9 by 4. Write 36 below the 36 we already have. The quotient is 49.

We check by multiplying 49 by 4. The product is 196. The answer is correct.

```
  49
  ×4
  --
 196
```

Write your division examples neatly. This is important.

Neatness helps you to be accurate.

Copy these examples and write the quotients. Check your answers. Show all your work on your paper.

	a	b	c	d	e
1.	4)172	5)265	4)264	3)225	6)204
2.	5)485	6)474	7)301	6)504	7)504
3.	4)216	6)378	5)425	7)294	4)348
4.	3)288	7)455	4)372	6)516	5)375

HARDER DIVISION WITH A REMAINDER

When we divide a three-place number there is sometimes a remainder. Study the example at the right.

```
   61
4)247
  24
   7
   4
   3
```

There are six 4's in 24. There is one 4 in 7 with a remainder of 3. The quotient is 61 with a remainder of 3.

Copy these examples and find the answers:

	a	b	c	d	e	f
1.	4)166	3)158	5)106	4)129	3)288	5)208
2.	6)137	4)366	6)208	4)289	7)289	7)449
3.	5)157	7)225	6)260	4)354	6)373	7)321

Check

```
  61
 ×4
 244

 244
 +3
 247
```

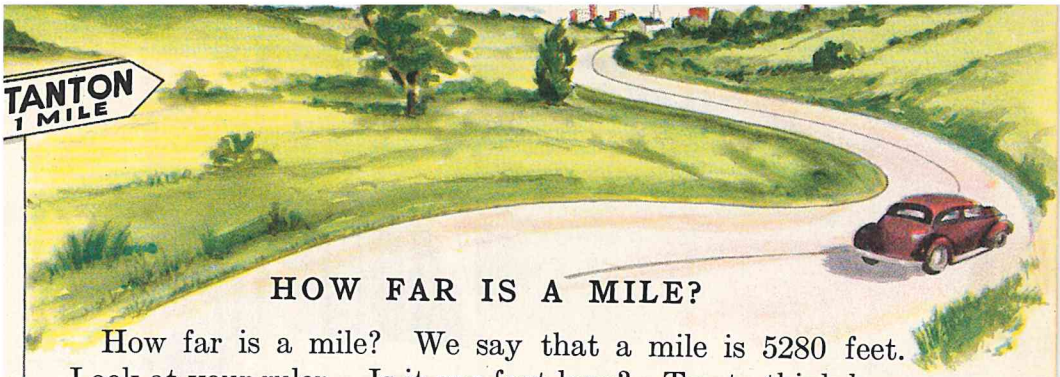
Notice how we check the division example at the top of the page. We divided 247 by 4. The quotient was 61 with a remainder of 3. To check, we first multiply 61 by 4. The product is 244. Then we add the remainder 3. The sum is 247. The answer checks.

4. Check your answers to the examples in Rows **1, 2,** and **3** above.

Here are the names of the numbers in a division example:

```
        21 quotient
divisor 4)84 dividend
```

Be sure that you know how to pronounce and spell the three words. Your teacher will help you if you need help.



HOW FAR IS A MILE?

How far is a mile? We say that a mile is 5280 feet. Look at your ruler. Is it one foot long? Try to think how far 5280 times the length of a foot ruler is.

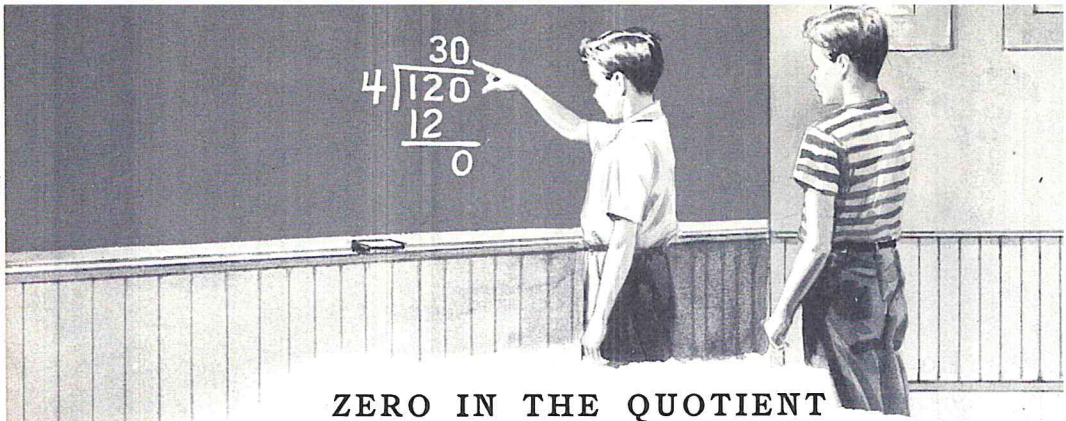
The next time you ride in an automobile watch the speedometer to see how far you go when you drive exactly one mile. If your father has a car, ask him if he will help you measure, on the car's speedometer, how far it is from your home to your school, your church, or your grocer.

5280 feet (ft.) = 1 mile (mi.)
1760 yards (yd.) = 1 mile

If you can, read the mileage on a car to see how far it has gone.

Answer, "Yes," or, "No":

1. A boy can walk two miles in an hour.
2. A baseball player can throw a ball a mile.
3. A car can go 60 miles in one hour.
4. There is a skyscraper that is a mile high.
5. Airplanes have gone 500 miles an hour.
6. Ships are sometimes a mile long.
7. The earth is about 25,000 miles around.
8. Airplanes sometimes fly two miles high.
9. Some places in the ocean are more than four miles deep.
10. Some mountains are ten miles high.



ZERO IN THE QUOTIENT

What do you do in division when there is a zero in the number you are dividing? Study Example **A.** There are three 5's in 15. Write 3 above the 5 tens. Multiply 3 by 5. Write 15. There is nothing when we subtract. Bring down 0. Zero divided by 5 is 0. Write 0 above the 0 in the dividend. The quotient is 30.

A

```
   30
5)150
   15
    0

   30
  ×5
  150
```

We multiply 30 by 5 to check. The product is 150; so the answer is right.

B

```
   120        120
6)720         ×6
   6          720
   12
   12
    0
```

Study Example **B.** Explain each step of the work. Why is 1 written above the 7 in the dividend? Why is there a 0 in the ones' place of the quotient?

Copy these examples and write the quotients. Check your work. Show all your work on your paper.

	a	b	c	d	e
1.	4)160	7)210	4)280	3)210	5)900
2.	7)840	6)360	5)850	6)840	5)650

Time for Practice

Copy these examples and write the answers. Check your work.

	a	b	c	d	e
1.	3)72	4)48	5)55	4)176	6)666
2.	7)350	6)132	3)65	6)367	7)140
3.	7)182	6)85	7)92	5)580	6)420

These are for extra practice:

4.	4)52	6)84	7)81	5)650	3)360
5.	6)192	7)196	4)484	3)840	7)97
6.	5)750	4)247	7)217	6)480	7)420
7.	4)397	5)662	7)840	3)420	6)300

Time for Practice

Copy these examples and write the answers:

	a	b	c	d	e	f	g
1. Add:	27	38	92	84	69	73	46
	43	90	89	28	49	30	58
2. Subtract:	86	38	59	98	99	88	79
	55	16	42	47	51	52	37

	a	b	c	d	e	f
3. Add:	519	$1.82	709	$8.88	$9.19	293
	438	9.32	749	5.39	6.57	765
4. Subtract:	$8.29	847	$7.93	981	954	$5.87
	7.65	692	4.07	376	654	4.38

HOW MUCH HAVE YOU LEARNED?

(Chapter Test 5)

Copy these examples and write the answers:

	a	b	c	d	e
1.	90 ×6	82 ×3	79 ×4	47 ×5	68 ×7
2.	60 ×4	63 ×3	70 ×7	85 ×6	29 ×3
3.	59 ×6	223 ×3	826 ×4	916 ×6	743 ×6
4.	212 ×5	611 ×5	417 ×5	318 ×4	813 ×7
5.	470 ×4	706 ×7	568 ×4	392 ×7	814 ×7
6.	458 ×7	245 ×6	307 ×5	417 ×6	380 ×4

	a	b	c	d
7.	3)96	2)68	4)84	4)128
8.	5)155	6)126	4)92	5)165
9.	4)127	7)148	6)428	7)218
10.	7)350	6)240	4)184	5)115
11.	5)550	3)750	7)840	4)920

IMPROVE YOUR SKILLS

(Diagnostic Test 4)

Work each set of examples. If you miss more than one example in any set, you need to review. The number printed in heavier figures after the set tells you which page to review.

	a	b	c			d	e	f	
1.	52	60	41	(46)	2.	48	76	59	(49)
	×3	×2	×3			×2	×3	×3	

	a	b	c	
3.	$\frac{1}{2}$ of 6	$\frac{1}{4}$ of 8	$\frac{1}{3}$ of 9	(87)
4.	6)38	6)25	6)49	(101)
5.	5)550	4)484	6)666	(109)
6.	7)58	7)64	7)34	(117)

HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 5)

Work these problems. Show all your work on your paper.

1. Donald earned $2.10 each week helping in a grocery store. How much did Donald earn in 4 weeks?

2. Harry paid $1.75 for a new flashlight and $2.89 for a scout knife. How much did the two things cost together?

3. Phyllis bought a new doll that cost $5.95. She gave the clerk $10.00. How much change should she have received?

4. Ann's mother had a party. She bought 12 roses to put on 3 tables. How many roses were there for each table if she put the same number of roses on each table?

Turn to page 158.

5. Thomas counted the stamps in his collection. He found that he had 734. His aunt sent him 73 stamps as a present. How many stamps did Thomas then have?

6. Karen had $4.87 in her savings bank. Her sister Ruth had $7.32. How much less did Karen have than Ruth?

7. Sam had a post card collection. He had a scrapbook that would hold 500 cards. When he counted his cards he found he had 357. How many more cards must Sam collect before he has 500?

8. Alfred had a pen of chickens. Feed for the chickens cost $1.47 each week. How much did Alfred spend for feed in 7 weeks?

9. How much did the feed for Alfred's chickens cost each day?

★**10.** Helen had 36 pictures to mount in her scrapbook. She put 5 pictures on each page. How many pages did she need? How many pictures did Helen mount on the last page?

DO YOU LEARN AND REMEMBER?

(Progress Test 4)

Copy these examples and write the answers:

	a	b	c
1.	$2\overline{)64}$	$638 + 9$	$742 + 21$
2.	$\begin{array}{r} 619 \\ -147 \\ \hline \end{array}$	6×508	$165 - 4$

	a	b	c	d
3.	$22 - 2$	$7\overline{)47}$	$\begin{array}{r} 439 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} \$2.79 \\ \times 4 \\ \hline \end{array}$

	a	b	c	d
4.	$7.21 −2.49	$8.47 −3.84	7)350	$9.28 ×3

5. 847 − 58 7 × $.69 $.11 + $1.63 440 ÷ 4

6. Write these numbers, using Roman numbers: 16, 21, 24, 4, 19, 30

7. Draw a square; a rectangle that is not a square; a triangle.

8. Write the addition and subtraction families for these groups of numbers:

a. 17, 9, and 8 b. 3, 2, and 1 c. 12, 5, and 7

9. Write the multiplication and division families for these groups of numbers:

a. 3, 5, and 15
b. 6, 7, and 42
c. 32, 8, and 4
d. 63, 7, and 9

SOME DOT PROBLEMS

(Enrichment material)

In the examples below there are dots in place of some of the figures. Find the figures that should go where the dots are so that the answers will be correct.

	a	b	c	d	e
1.	13 3)3•	1• ×5 90	22 4)•8	101 5)••5	34 ×• 68
2.	14 4)•6	•• ×6 426	1• ×• 24	13 6)•8	•3 ×• 69

CHAPTER VI

Adding and Subtracting Larger Numbers

TRAVELING ON THE TRAIN

Clifford and Mary visited their grandmother in Center City. They went on the train. It was 160 miles from their home to Center City.

1. How far did they travel going to and coming from Center City?

2. The tickets cost 3¢ for each mile. How much would each ticket cost one way? both ways?

3. If Clifford and Mary bought round-trip tickets, they would save 75¢ on each ticket. How much would one round-trip ticket cost? (Use the second answer for Problem **2** to help you.)

4. Clifford and Mary each bought a round-trip ticket. How much did the tickets cost all together?

5. When Clifford and Mary paid for their round-trip tickets each gave the ticket agent a ten-dollar bill. How much change should each have received?

6. They ate lunch in the diner on the train. Clifford's lunch cost 60 cents. Mary's cost 75 cents. Each left 10 cents for the waiter. How much did it cost them all together to eat lunch?

7. On the way home Clifford's lunch cost 80 cents and Mary's cost 65 cents. Again each left 10 cents for the waiter. How much did these lunches cost all together?

8. How much did all their lunches on the train cost?

9. How much did the total trip cost?

★ **10.** If Clifford and Mary had decided to share the cost evenly, how much would each have paid?

Make Up Problems

★ Make up two problems about a train trip to ask the other pupils. Write the problems. Be sure that you know the answers to them.

HOW WE MAKE NUMBERS

How many different whole numbers can you make with the two figures 3 and 7 if you use each figure only once? You can make two: 37 and 73

1. How many whole numbers can you make with the three figures 2, 4, and 8 if you use each figure only once? Make these numbers.

Make as many numbers as you can with these figures. Use all the figures in each number and use each only once.

	a	b	c
2.	6, 2, 1	1, 7, 0	1, 3, 5, 7
3.	4, 9, 5	8, 2, 6	2, 4, 6, 8

Using Addition Facts

Copy these examples and write the sums. Add down. Check by adding up. These examples are easy. Work fast.

	a	b	c	d	e	f
1.	123 435	132 326	321 143	234 315	432 226	423 352
2.	523 104	543 422	634 150	646 222	636 311	763 204
3.	482 307	556 212	736 151	487 302	392 405	587 111
4.	380 116	406 303	555 444	626 132	482 104	727 170
5.	136 233	325 414	890 100	242 535	734 134	820 120
6.	511 310	530 304	115 560	452 422	410 178	210 189

FLYING TO ASIA

(Subtraction problems)

Flying Time	To Tokyo	To Manila
New York	39 hours	51 hours
Chicago	35 hours	47 hours
Minneapolis	33 hours	45 hours
Seattle	27 hours	39 hours

The number of hours it takes to fly from each of four American cities to Tokyo and to Manila is shown in the table above.

1. How much longer does it take to fly from New York to Toyko than from Seattle to Tokyo?

2. How much longer does it take to fly from Minneapolis to Manila than to Tokyo?

3. How many fewer hours does it take to fly from Chicago to Tokyo than to Manila?

4. How much longer does it take to fly from New York to Manila than from Seattle to Tokyo?

5. How many more hours than one day is a trip from Chicago to Tokyo?

6. How many more hours than one day is a trip from Seattle to Manila?

★**7.** Does any trip take more than two days? How many hours more?

Do It Quickly

Copy these examples and add. Check your answers.

	a	b	c	d	e	f	g	h	i
1.	9	6	2	7	5	4	6	4	8
	8	9	4	6	4	3	4	2	1
	1	2	7	4	6	4	7	7	4
2.	7	8	6	8	9	4	6	3	1
	9	9	7	8	2	5	3	8	8
	3	6	7	8	9	8	8	3	3
	4	7	6	4	1	4	7	9	8
3.	5	3	6	7	5	7	2	1	1
	6	6	6	4	2	3	7	6	4
	2	5	2	6	1	3	2	6	1
	3	4	3	1	1	4	1	2	5
	1	1	2	1	8	2	1	4	7
4.	7	8	5	9	7	6	9	8	6
	7	6	3	6	5	5	7	7	8
	1	4	3	2	5	9	2	1	4
	5	6	8	2	5	3	8	7	5
	6	5	7	9	4	6	2	6	2
5.	7	9	9	5	9	7	5	4	5
	8	4	9	8	7	7	9	9	7
	8	9	6	8	9	8	7	9	9
	8	9	7	9	8	8	9	8	9
6.	8	9	3	2	8	5	8	2	4
	5	4	5	9	4	5	3	7	7
	7	8	7	9	3	7	8	9	4
	4	7	8	2	9	7	7	9	9
	7	8	9	9	8	6	9	9	7

ADDING THREE TWO-PLACE NUMBERS

Study Example **A.** First we add the ones' column: 5 and 3 are 8; 8 and 6 are 14. This is 4 ones and 1 ten. We write the 4 in the ones' column and carry the 1 ten to be added to the tens' column. Now we add the tens' column: 1 and 1 are 2; 2 and 2 are 4; 4 and 3 are 7. We write the 7 in the tens' column. The sum is 74.

A

$$\begin{array}{r} 15 \\ 23 \\ \underline{36} \\ 74 \end{array}$$

Sometimes we must carry 2 to the tens' column. If the ones' column adds to a number with 2 tens, we must carry 2 to the tens' column. Study Example **B.**

B

$$\begin{array}{r} 27 \\ 49 \\ \underline{79} \\ 155 \end{array}$$

Copy these examples and write the sums. Add down. Check by adding up.

	a	b	c	d	e	f	g
1.	14	16	48	26	34	15	18
	25	33	27	47	28	44	23
	38	24	12	25	14	27	45
2.	19	34	45	16	17	59	48
	27	28	28	49	59	29	48
	36	38	17	26	38	29	18

ADDING FOUR TWO-PLACE NUMBERS

(*Two-place sums*)

All our school work should be neat and orderly. When we copy arithmetic examples it is important to copy the numbers correctly. We must write the numbers neatly so that we know what they are. Our 1's must not look like 7's; our 5's must not look like 9's. If our work is not neat

and orderly, we may get incorrect answers when we really know how to get the right answers.

Copy these examples and write the sums:

	a	b	c	d	e	f	g
1.	13	14	45	54	27	19	18
	25	10	13	18	21	20	23
	32	27	12	12	34	30	12
	21	14	16	15	14	25	24
2.	10	17	13	25	16	12	35
	24	17	12	22	26	14	23
	28	22	49	22	36	24	13
	10	12	12	25	10	10	13
3.	14	25	18	36	44	10	26
	26	24	14	29	18	15	20
	18	17	24	16	18	19	16
	23	26	27	17	11	19	18
4.	15	29	31	18	14	28	15
	18	29	11	18	19	16	25
	10	19	19	16	14	28	16
	17	10	19	32	24	26	15

THE PET SHOW

(Different processes in problem solving)

The children in Don's neighborhood had a pet show. They had the show in Don's garage. They printed tickets, which they sold to their friends for 6¢ each. They sold 36 tickets. They had the following expenses: straw for pens for animals, 20¢; paper for making tickets, 5¢; paper for signs for the pet show, 15¢.

Work these problems about the pet show. Show all your work on your paper.

1. How much money did the children take in for the pet show?

2. How much were their expenses?

3. The children gave the money that they had left over to help buy things for the playground. How much did they give?

4. There were eight children in the group who had the pet show. How much money would each have had if they had divided equally the money that they gave for the playground?

5. When the children were getting ready for the pet show David bought a new collar for his dog Spot. The collar cost $1.25. David gave the clerk a five-dollar bill. How much change should he have received?

6. Linda bought a new cage for her canary. It cost $6.55. She had saved $7.50 to buy the cage. How much did she have left from her savings?

7. Mike had a pair of rabbits that he brought to the show. He bought them bags of food that cost 42¢ each. Each bag of food lasted a week. How much did the rabbit food cost for each day?

MORE ADDITION OF FOUR TWO-PLACE NUMBERS

(Three-place sums)

Sometimes when we add two-place numbers we have a three-place answer. This means that when we add the tens' column we get a number that has tens and hundreds.

$$\begin{array}{r} 24 \\ 37 \\ 76 \\ 31 \\ \hline 168 \end{array}$$

In the example at the right when we add the ones' column we get 18. We write 8 and carry 1 ten. When we add the tens' column we get 16. This is really 6 tens and 1 hundred. We do not have a hundreds' column to add; so we write 16. The sum is 168. This is 1 hundred, 6 tens, and 8 ones.

Copy these examples and write the sums:

	a	b	c	d	e	f	g
1.	43	12	12	54	41	80	25
	13	27	31	21	12	33	21
	12	31	41	26	20	41	31
	21	24	84	90	15	46	12
2.	50	45	48	11	14	14	12
	42	13	70	30	12	17	33
	47	22	63	22	42	41	18
	20	14	13	36	89	11	61

Time for Practice

Copy these examples and write the answers:

	a	b	c	d	e
1.	308	617	209	725	428
	×5	×4	×6	×7	×6
2.	716	428	639	536	418
	×6	×3	×7	×5	×7

HOW HEAVY IS A TON?

How heavy is a ton? A ton is 2000 pounds. You know how heavy a pound of butter is or a pound of coffee. Try to think how heavy 2000 pounds of butter or 2000 pounds of coffee would be. This would be one ton.

If your father buys coal, he probably buys it by the ton. Have you ever seen a ton of coal?

Some sacks of flour weigh 24 pounds. It would take more than eighty-three 24-pound sacks to weigh a ton.

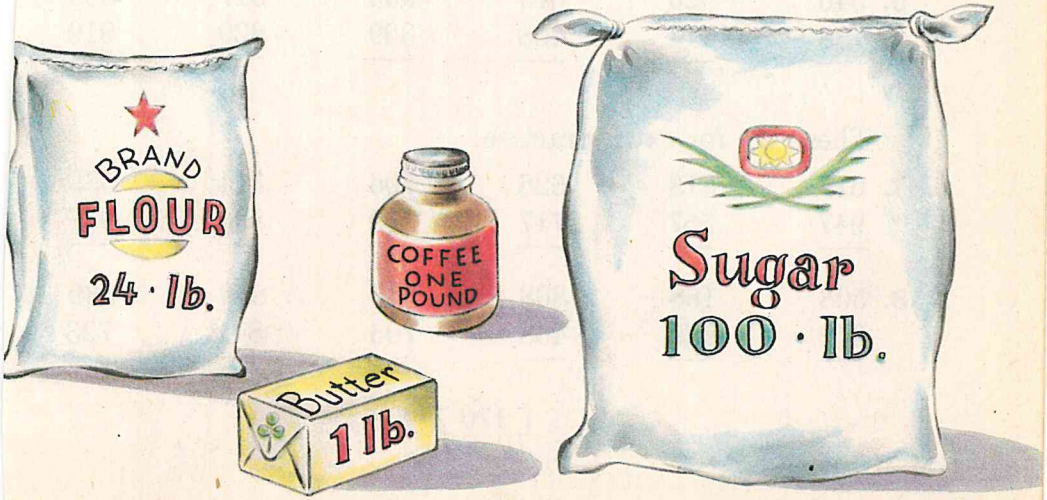
Sugar often comes in 5- or 10-pound bags. Can you tell how many 5-pound bags it would take to weigh a ton? how many 10-pound bags?

The grocer sometimes buys sugar in 100-pound bags. How many 100-pound bags would it take to weigh a ton?

2000 pounds = 1 ton

Answer, "Yes," or, "No":

1. Ten men might weigh a ton.
2. All the pupils in your class together might weigh a ton.
3. A ton of iron weighs more than a ton of cork.
4. An elephant can weigh a ton.
5. A ton is more than any man can lift.



Time for Practice

Copy these examples and find the sums:

	a	b	c	d	e	f
1.	309	218	358	103	514	729
	417	554	612	678	207	269
2.	622	109	103	315	324	659
	338	223	337	249	349	131

Rows **3** and **4** are for extra practice:

3.	434	123	436	405	406	127
	458	829	234	448	558	743
4.	647	535	129	236	418	317
	208	305	508	119	119	679

Copy these examples and find the sums:

	a	b	c	d	e	f
5.	386	947	615	904	727	274
	805	618	818	587	736	809
6.	546	926	613	955	817	339
	738	414	468	309	929	919

These are for extra practice:

7.	617	813	626	706	514	539
	947	557	717	559	836	947
8.	508	168	808	945	849	339
	642	929	468	706	841	723

Time for Practice

Copy these examples and write the answers:

	a	b	c	d	e
1.	304 ×4	318 ×6	437 ×5	516 ×3	413 ×7
2.	588 ×5	547 ×6	158 ×4	826 ×7	327 ×3
3.	827 ×6	619 ×5	649 ×3	595 ×7	209 ×6
4.	802 ×7	709 ×4	750 ×3	276 ×4	802 ×5
5.	3)9	4)21	2)10	5)18	3)19
6.	5)40	3)22	5)5	5)29	4)28
7.	3)25	2)17	3)5	4)38	4)26
8.	4)7	5)49	3)29	5)16	4)19

How Many Are There?

Write the answers to the following questions:

1. How many feet are there in a mile?
2. How many years are there in a century?
3. How many ounces are there in a pound?
4. How many pounds are there in a ton?
5. How many seconds are there in a minute?
6. How many yards are there in a mile?

FINISH THESE PROBLEMS

In these problems you are given some facts, but you are not told what to find. Write a problem using the facts that you are given. Then work each problem.

1. Eggs cost 68¢ a dozen. Mary's mother bought 5 dozen.

2. Harry earned $4.21. Clarence earned $3.18.

3. John worked 6 days for Mr. Smith. He was paid $4.00 a day.

4. Ivan has 13 marbles. David has 17 marbles. Tom has 28 marbles.

5. Phyllis has $4.38 in her bank. Her aunt gave her $2.25 as a birthday present.

6. Tom and five friends went on a hike. Tom had 24 marshmallows.

7. Olga's mother bought 6 yards of ribbon. It cost 32¢ a yard.

8. Mrs. Adams bought 175 baby chicks. Thirteen were white.

9. Mr. Crowe earned $1.35 an hour. He worked 7 hours each day.

10. Mr. Snow earned $8.40 each day. He worked 6 hours each day.

Numbers Are Names!

In some games the players wear numbers. Football players wear numbers. Tell of other games in which players wear numbers. How do the numbers that players wear help us?

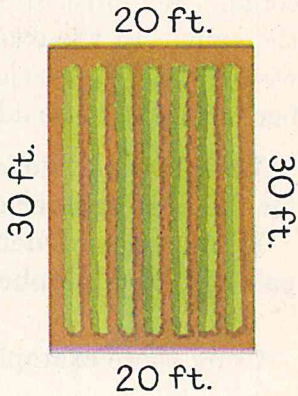
FENCING A VEGETABLE GARDEN

(Meaning of perimeter)

Fred and his father had a vegetable garden. Rabbits were eating their vegetables; so they decided to put a fence around the garden.

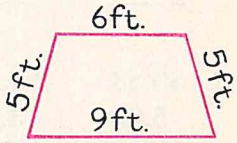
The distance around the garden is called the **perimeter.** Fred and his father had to find the perimeter of the garden to know how much fence to buy. The garden was 20 feet wide and 30 feet long. Fred found the perimeter by adding. He added $20 + 30 + 20 + 30$. The answer is 100.

The perimeter of the garden was 100 feet.



The distance around any surface is called the perimeter.

1. This is a drawing of Mary's flower garden. What is its perimeter?



2. Kenneth has a sandbox. It is the shape of a triangle. Each side is 3 feet long. What is its perimeter?

3. Find the perimeter of Fred's vegetable garden by multiplying and adding. Multiply the width by 2 and the length by 2. Add these products. What is the perimeter?

★**4.** Tom had a fish pool that had six sides. Each side was the same length, 7 feet. What was the perimeter? Find the answer by adding. Find the answer by multiplying.

ADDING DOLLARS AND CENTS

(Review)

When we add dollars and cents, we must be careful to put the decimal point in the sum to show dollars and cents. We must also put the dollar sign in front of the sum. In the example at the right you see that we write the dollar sign for just the first of the numbers that are to be added.

$2.89
5.80
$8.69

When we add dollars and cents, we write the dollar sign for the first number and for the sum.

When we add dollars and cents, we write the decimal point for each number to be added and for the sum.

Copy these examples and write the sums:

	a	b	c	d	e	f
1.	$6.94	$8.92	$3.94	$4.87	$8.50	$9.60
	1.45	2.65	4.46	9.36	1.78	2.63
2.	$6.83	$5.49	$2.56	$7.79	$5.95	$5.98
	5.65	3.91	2.54	7.73	4.20	6.35

	a	b	c	d	e	f	g
3.	$.34	$.49	$.25	$.46	$.45	$.46	$.69
	.64	.52	.56	.88	.85	.36	.67
	.54	.76	.49	.27	.35	.58	.18
4.	$.17	$.65	$.33	$.68	$.81	$.14	$.96
	.80	.47	.70	.15	.67	.55	.38
	.39	.52	.41	.33	.29	.24	.22
	.16	.74	.89	.90	.76	.15	.49

ADDING THREE-PLACE NUMBERS

(Review)

Sometimes when we add we carry only to the tens' place, sometimes to the hundreds' place. Sometimes we carry to both the tens' and hundreds' places in the same example.

When the hundreds add to a two-place number we must be sure to write it in the hundreds' and thousands' places in the sum.

Study the example at the right. Explain each step of the addition.

$$\begin{array}{r} 542 \\ 898 \\ \hline 1440 \end{array}$$

Copy these examples and write the sums:

	a	b	c	d	e	f
1.	390	249	661	708	285	237
	216	922	366	894	426	589
2.	421	358	568	972	398	489
	494	752	142	152	178	247
3.	431	639	179	369	826	986
	382	690	372	884	585	971
4.	672	238	869	729	926	780
	252	879	671	395	890	630

Arithmetic Words

Write the answers:

1. When we add what is the answer called?
2. When we subtract what is the answer called?
3. When we divide what is the answer called?
4. When we multiply what is the answer called?
5. What is the distance around a surface called?

TWO-STEP PROBLEMS

Ralph had $6.50. He bought a toy car that cost $.98 and a notebook that cost $.25. After Ralph paid for the car and notebook how much money did he have left?

To work this problem, we must first find out how much Ralph paid for the car and notebook together. This is the first step in finding the answer. Then we must subtract this sum from the amount of money that Ralph had. This is the second step.

How much did Ralph pay? Here we must add $.98 and $.25. Ralph paid $1.23.

$$\begin{array}{r} \$\ .98 \\ +.25 \\ \hline \$1.23 \end{array}$$

How much did Ralph have left? Here we must subtract $1.23 from $6.50. Ralph had $5.27 left.

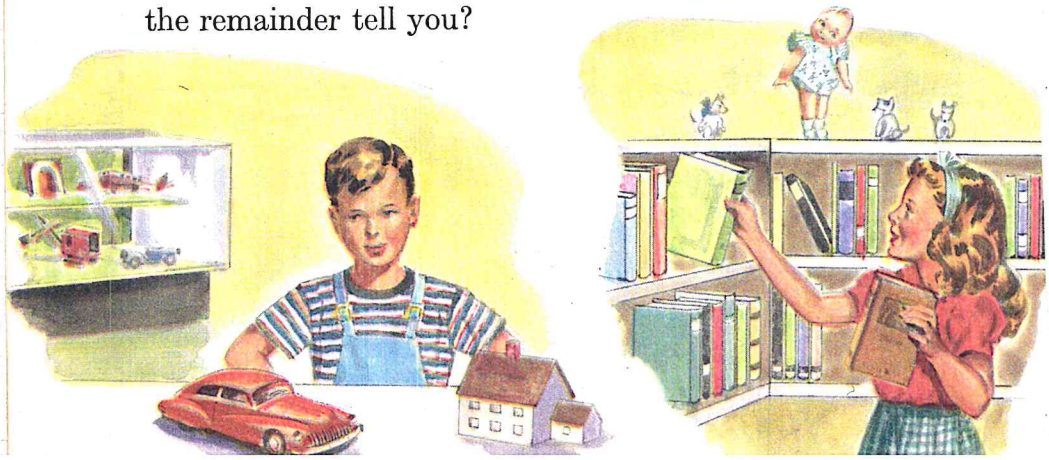
$$\begin{array}{r} \$6.50 \\ -1.23 \\ \hline \$5.27 \end{array}$$

Sometimes in a problem we must first find another answer in order to find the answer the problem asks us to find.

Mary had 24 books of her own. She gave 4 to a sick friend and 7 to her little sister Sue. How many books did Mary have left?

What numbers do you add? What does this sum tell you?

What numbers do you use in subtracting? What does the remainder tell you?



Work these problems. Show all your work on your paper.

1. Ann had 17 pieces of doll furniture. She broke 3 pieces and lost 2 pieces. How many pieces of doll furniture did she have left?

2. David had $4.10. He bought some goldfish for $.45 and a bowl to put them in for $.25. How much money did he have left after he paid for the goldfish and bowl?

3. Fay's father bought 100 stamps. One day he used 17 and another day he used 24. How many stamps did he then have left?

4. Tom had 50 cents. To treat his friends, he bought 3 ice cream cones. They cost 7¢ each. How much did Tom have after he had paid for the 3 ice cream cones? (Hint: First we multiply; then we subtract.)

5. Carol bought 4 pencils that cost 5¢ each. She gave the clerk 25¢. How much money should the clerk have given back to Carol?

6. Dan raised chickens. He had 75 in his flock. One day he sold 15 and another day 12. How many chickens did Dan have left?

Time For Practice

Copy these examples and write the sums:

	a	b	c	d	e	f
1.	500	800	900	400	700	600
	500	800	900	400	700	600
	500	800	900	400	700	600
2.	$2.50	$3.00	$ .90	$4.00	$6.00	$.30
	2.50	2.00	1.00	.50	8.00	.60
		1.50	.10		9.00	.10

Time For Practice

Copy these examples and write the products. Check by going over your work.

	a	b	c	d	e
1. Multiply by 3:	53	79	46	82	89
2. Multiply by 4:	54	23	10	65	98
3. Multiply by 5:	67	38	21	50	97
4. Multiply by 6:	40	89	76	59	41
5. Multiply by 7:	23	48	76	13	59

	a	b	c	d
6. Multiply by 3:	478	965	370	295
7. Multiply by 4:	675	984	307	691
8. Multiply by 5:	265	409	837	651
9. Multiply by 6:	308	767	954	825
10. Multiply by 7:	407	865	923	784

Copy these examples and write the quotients. Check by multiplying.

	a	b	c	d	e
11. Divide by 3:	45	63	84	96	48
12. Divide by 4:	60	44	72	92	56
13. Divide by 5:	80	60	95	65	85
14. Divide by 6:	78	66	90	96	72
15. Divide by 7:	77	84	91	98	70

	a	b	c	d
16. Divide by 3:	363	669	273	714
17. Divide by 4:	248	312	150	472
18. Divide by 5:	555	424	373	740
19. Divide by 6:	366	252	192	493
20. Divide by 7:	217	289	784	573

ADDING THREE THREE-PLACE NUMBERS

It is almost as easy to add three three-place numbers as it is to add two three-place numbers.

1. Copy these examples and write the sums. These examples are easy.

a	b	c	d	e
312	404	105	257	309
123	312	300	210	240
324	211	272	421	440

2. In this exercise you will have a two-place number when you add the hundreds' column. Copy these examples and write the sums:

a	b	c	d	e
532	850	772	420	863
606	909	702	621	803
661	140	724	728	233

In Exercises **3** and **4** you will have to carry. Work carefully. Copy these examples and write the sums:

	a	b	c	d	e
3.	424	262	157	407	471
	108	144	392	206	308
	648	263	226	108	608
4.	584	586	588	104	153
	140	448	766	297	258
	605	172	842	383	285

PROBLEMS WITHOUT NUMBERS

(Help with problem solving)

Study this problem:

June had a pen of chickens. She told Mary how many were black and how many were red. How many chickens were there all together?

To find out how many chickens June had, we would add. We would add the number of black chickens and the number of red chickens. The sum would tell us the number of chickens there were all together.

Now tell how to find the answers to these problems:

1. June fed her chickens the same number of pounds of grain each day. How much did she feed them in a week?

2. June sold eggs by the dozen to her neighbors. How much does she get for her eggs each time she sells them?

3. Part of the chickens were sold in the fall. How many were left?

4. The chickens were sold by the pound. How much would each chicken bring?

5. The black chickens laid white eggs. The red chickens laid brown eggs. How many eggs were laid each day?

6. How many eggs were laid each week?

★**7.** Choose four of the problems and write them with numbers. Work the problems that you write. Show all your work on your paper.

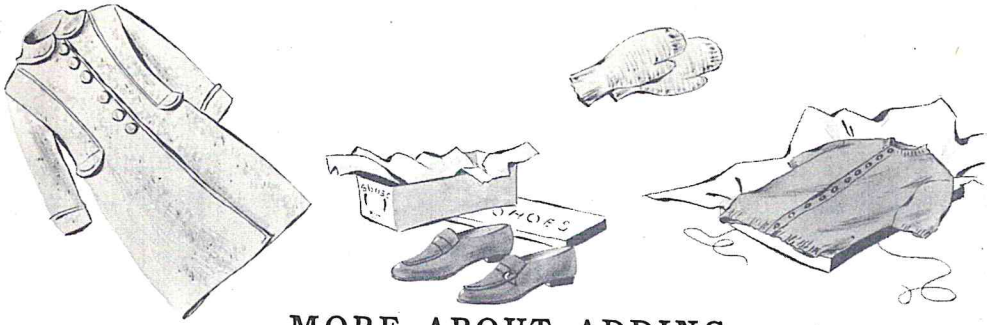
ADDING FOUR THREE-PLACE NUMBERS

We add four three-place numbers in the same way that we add three three-place numbers. Copy the examples below and find the sums. Be sure to carry correctly. Add down. Check by adding up.

	a	b	c	d	e
1.	112	203	212	318	606
	205	114	317	207	169
	348	327	125	128	106
	216	148	201	146	109
2.	214	158	177	355	234
	325	242	136	485	483
	119	267	284	620	139
	423	117	126	578	579
3.	408	165	148	457	898
	371	354	232	880	733
	201	878	751	865	773
	896	667	228	694	983

The Telephone Call

Ruth is talking on the telephone to her grandmother, who lives in another city. She is making a **long-distance call.** She is making her call in the evening so that she will pay the **night rate.** This rate is **cheaper** than the **day rate,** which she would pay if she called during the day. If she were talking to someone in her own city, she would be making a **local call.**



MORE ABOUT ADDING

Alma went shopping with her mother for school clothes. They bought a coat that cost $16.95, a sweater that cost $3.25, mittens that cost $.79, and shoes that cost $5.25. Alma added to see how much the clothes cost.

Coat	**$16.95**
Sweater	**3.25**
Mittens	**.79**
Shoes	**5.25**
Total	**$26.24**

When Alma added she was careful to keep the figures in the right columns. When we add money numbers we should keep the decimal points in a straight column.

Copy these examples and add. Be sure the figures are in the right columns. Add down. Check by adding up.

1. $4.32 + $.68 + $.74 + $16.21
2. $.87 + $1.92 + $.43 + $10.00
3. $5.45 + $8.19 + $.29 + $.06
4. $16.75 + $6.12 + $.82
5. $10.00 + $1.00 + $.10 + $.01
6. $4.97 + $7.38 + $.56 + $.40
7. $12.00 + $8.10 + $.90
8. $.38 + $6.15 + $.28
9. $15.00 + $.45 + $.50 + $5.00
10. $19.25 + $6.50 + $3.10 + $11.75

Time for Practice

The following subtraction examples will help you review borrowing. Copy these examples and write the differences. Check by adding.

	a	b	c	d	e	f
1.	684	560	778	728	683	482
	247	415	659	519	268	144
2.	291	780	817	538	391	617
	124	236	508	219	183	508
3.	362	896	876	437	543	726
	108	629	768	119	205	607
4.	145	976	414	765	524	150
	106	548	406	528	309	102
5.	951	955	172	343	235	614
	815	327	148	124	216	605

Without Paper and Pencil

1. When we subtract 0 from a number what number is always left?

2. When we subtract a number from itself what is always the answer?

3. Is the difference always smaller than the number subtracted from?

4. How do the addition facts help us with the subtraction facts?

ZERO IN THE NUMBER SUBTRACTED FROM

Study the following example:

$$\begin{array}{rl} 502 = & 4 \text{ hundreds } 9 \text{ tens } 12 \text{ ones} \\ -135 = & 1 \text{ hundred } \ 3 \text{ tens } \ 5 \text{ ones} \\ \hline & 3 \text{ hundreds } 6 \text{ tens } \ 7 \text{ ones} = 367 \end{array}$$

We can write the example this way:

$$\begin{array}{r} \overset{4}{\cancel{5}}\,\overset{9}{\cancel{0}}\,\overset{12}{\cancel{2}} \\ -1\,3\,5 \\ \hline 3\,6\,7 \end{array}$$

We cannot borrow from 0 tens. We borrow 1 hundred to make 10 tens. Then we borrow 1 ten to make 12 ones.

Copy these examples and write the remainders. Check by adding.

	a	b	c	d	e	f
1.	406	602	504	801	702	903
	138	247	126	465	354	617
2.	305	507	904	706	801	608
	128	279	598	487	342	279

SUBTRACTING FROM FOUR-PLACE NUMBERS

Copy these examples and find the differences. These examples are easy. If you make errors, find the facts you missed and study your practice cards for those facts.

	a	b	c	d	e	f
1.	2915	8287	9278	3342	4750	3633
	1702	5186	106	1241	2510	601

We borrow when we subtract from four-place numbers in the same way that we borrow when we subtract from three-place numbers. Study the example at the right. Explain each step of the work.

$$\begin{array}{r} {\scriptstyle 7\ 12} \\ 7\,3\,\cancel{8}\,\cancel{2} \\ -2\,1\,4\,9 \\ \hline 5\,2\,3\,3 \end{array}$$

Copy these examples and write the differences. Here you will borrow from the tens' place.

	a	b	c	d	e
2.	1573	3465	4780	6257	3868
	1246	1247	2155	1028	1739
3.	4792	5436	3838	2144	4381
	1354	2107	1519	1128	1155
4.	6470	4443	3895	9577	7264
	1436	1307	1146	6248	2159

Copy these examples and subtract. In these examples you will borrow from the hundreds' place.

5.	4436	5628	3856	8540	6774
	1273	1352	1481	2180	2582
6.	8519	6372	9665	9734	7863
	4026	4181	3270	1251	4192
7.	7924	4587	8888	9883	4958
	5161	2492	6294	4490	1262

Without Paper and Pencil

1. Add 6 to each of these numbers:

9 18 27 36 45 54 63 72

2. Add the numbers 5, 7, 8 to each of the numbers above.

HOW MANY MILES IS IT?

You will find tables with road maps like the table on this page. These tables tell how far it is from city to city.

	Boston	Chicago	Los Angeles	St. Paul	New Orleans	New York	Philadelphia	San Francisco
Boston	0	979	3130	1399	1625	219	313	3198
Chicago	979	0	2189	420	977	841	759	2233
Los Angeles	3130	2189	0	2033	1947	2911	2829	405
St. Paul	1399	420	2033	0	1279	1261	1179	2077
New Orleans	1625	977	1947	1279	0	1406	1312	2300
New York	219	841	2911	1261	1406	0	94	3042
Philadelphia	313	759	2829	1179	1312	94	0	2960
San Francisco	3198	2233	405	2077	2300	3042	2960	0

Use the table in this way: Look at the column at the left to find the name of the city from which you wish to start. Look across the top of the table to find the name of the city to which you wish to go. Move your finger from the name of the first city along the line until you come to the column under the name of the second city. The number at this point is the number of miles from the first to the second city.

The distance from Boston to Chicago is 979 miles. The distance from St. Paul to Los Angeles is 2033 miles.

1. Find these distances: Chicago to New Orleans, New York to Boston, Philadelphia to New York, Los Angeles to San Francisco.

2. Do you find the same number in the table when you find the distance from New Orleans to Chicago as when you find the distance from Chicago to New Orleans?

Work these problems. Show all your work on your paper.

3. How far is it from Boston to New York and then from New York to New Orleans?

4. How far is it from St. Paul to Chicago and then from Chicago to San Francisco?

5. How much closer is Boston to New York than to Philadelphia?

6. How much closer is New Orleans to Chicago than to Los Angeles?

★**7.** How far would you travel if you made a trip from Boston to Chicago, Chicago to St. Paul, St. Paul to San Francisco, San Francisco to New Orleans, and New Orleans back to Boston?

Making Change

How much change should the clerk give you if he has to take:

1. 73¢ from $1.00?

2. 24¢ from 50¢?

3. 16¢ from 25¢?

4. 38¢ from $1.00?

5. 26¢ from 3 dimes?

6. 56¢ from 3 quarters?

7. 98¢ from $5.00?

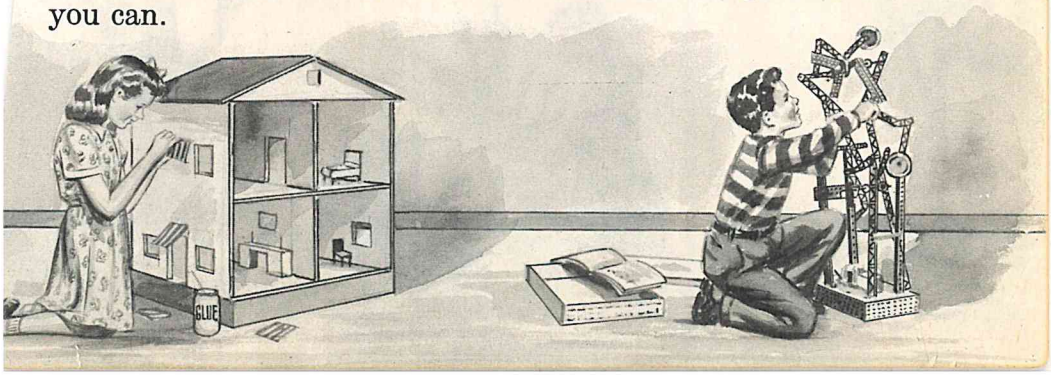
8. $2.50 from $5.00?

9. $6.00 from $10.00?

10. $11.00 from $20.00?

Finding Triangles and Rectangles

Find as many triangles and rectangles in this picture as you can.



WHAT SHALL WE NAME THE ANSWER?

We must always be sure when we work problems that we answer the question asked. The number that we get when we work a problem has a name. We must name the answer.

Mr. Blake took some boys on a hike. Then he bought them each a treat at the soda fountain. There were 5 boys. Each treat cost 30¢. How much did the treats for all the boys cost?

The numbers are 30 and 5. Shall we add, subtract, divide, or multiply?

We could add these numbers. $30 + 5 = 35$. Would 35 answer the question? We could divide the numbers. $30 \div 5 = 6$. Would 6 be the answer?

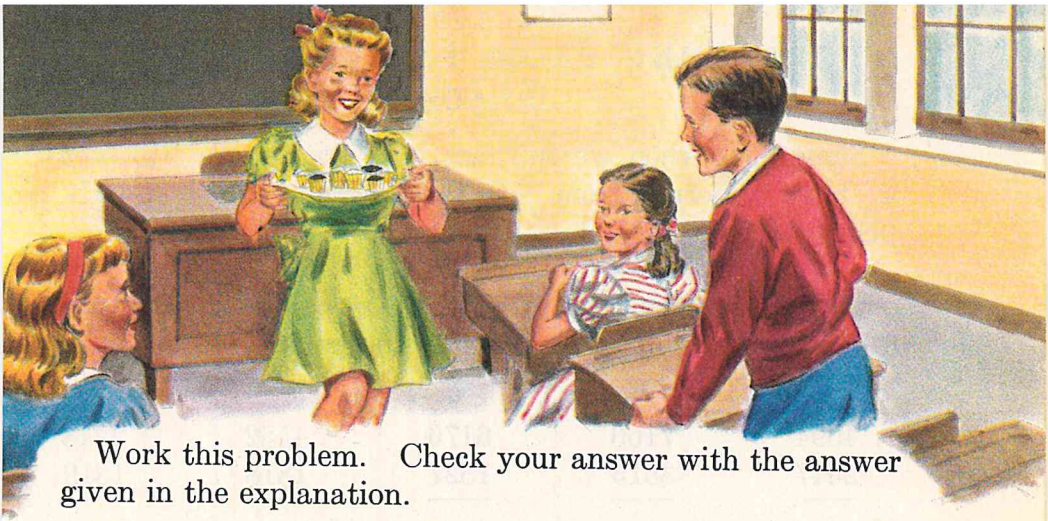
When we think about the problem we decide that we must multiply the numbers. $5 \times 30¢ = 150¢$, or \$1.50. This is the answer. It tells us that Mr. Blake paid \$1.50. The name of the answer is cents, which we have changed to dollars and cents.

When we work a problem, we must name the answer.

Helen received a new doll for her birthday. It cost \$4.80. She also received a new doll buggy. It cost \$6.20. How much did they cost together?

The word **together** helps us to decide that we must add. We must add the cost of the doll and the cost of the doll buggy. Together they cost \$11.00. The answer is in dollars and cents.

$$\begin{array}{r} \$4.80 \\ 6.20 \\ \hline \$11.00 \end{array}$$



Work this problem. Check your answer with the answer given in the explanation.

The pupils in Carol's room had a birthday tea for Carol. There were 28 pupils in the room. Carol's mother sent little cupcakes. They were passed three times, and each time every pupil got a cupcake. How many cupcakes did the pupils eat?

In this problem we must multiply to find how many cupcakes the pupils ate. For 28 pupils there are 3 × 28, or 84, cupcakes. The answer is 84 cupcakes.

28 cupcakes
×3
84 cupcakes

Work these problems. Show all your work on your paper. Be sure to name each answer.

1. Carl bought his dog a collar that cost $1.90 and a blanket that cost $3.20. How much did the two things cost?

2. Sarah's mother baked six pans of cookies. There were 14 cookies on each pan. How many cookies did she bake?

3. John delivered papers. He delivered 32 each day six days in a week. How many did he deliver in a week?

4. Anna was putting pictures in her picture album. She had 20 pictures and put 4 on each page. How many pages did she need?

BORROWING FROM THE THOUSANDS' PLACE

Sometimes when we subtract from four-figure numbers we have to borrow from both the tens' and the thousands' place.

Copy these examples and write the remainders. Be careful about the columns from which you borrow.

	a	b	c	d	e
1.	4094	7160	6176	4552	2248
	2647	3515	1527	1818	1819
2.	5418	8883	3485	5311	3327
	1709	5926	1867	4403	1408

Study the example at the right. Tell how we get the 12 tens to subtract the 5 tens from. Tell where we get the 13 hundreds to subtract the 8 hundreds from. Tell where we get the 5 thousands to subtract the 3 thousands from.

5	13	12	11
~~6~~	~~4~~	~~3~~	~~1~~
3	8	5	7
2	5	7	4

Copy these examples and write the remainders:

	a	b	c	d	e
3.	4382	5739	6517	9730	8503
	1694	1849	1818	2847	4627
4.	4907	7634	6103	8018	3257
	1908	4758	2664	5179	1468
5.	7426	5381	9067	6602	8340
	2847	1586	3398	2845	4678

Time for Practice

Copy these examples and find the products. Be sure to check your work.

	a	b	c	d
1. Multiply by 6:	165	430	872	944
2. Multiply by 5:	403	667	951	825
3. Multiply by 4:	256	498	370	172
4. Multiply by 7:	308	521	946	753

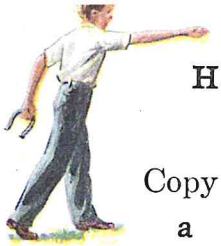
Copy these examples and find the quotients. Check your work by multiplying.

	a	b	c	d
5. Divide by 5:	325	415	245	305
6. Divide by 4:	148	304	116	268
7. Divide by 6:	132	228	306	594
8. Divide by 7:	504	301	273	455

Time for Practice

Copy these examples and find the answers. Be sure to check your work.

	a	b	c	d	e
1.	$9637 - 7911$	$775 + 826$	743×3	526×6	$3\overline{)144}$
2.	974×7	$756 + 918$	$2294 - 1319$	$4\overline{)204}$	437×5
3.	$6\overline{)168}$	$7\overline{)105}$	$7641 - 1765$	943×6	$8273 - 2518$
4.	$7033 - 6427$	$6\overline{)288}$	$860 + 912$	$7\overline{)693}$	635×7



HOW MUCH HAVE YOU LEARNED?

(Chapter Test 6)

Copy these examples and find the answers:

	a	b	c	d	e
1.	17 24 15 43	19 47 58 26	384 162 518 479	463 728 190 958	827 16 43 548
2.	$8.09 .62 .58	$14.07 −10.83	$4.28 +6.15	$8.28 −1.15	7150 −3826

	a	b	c	d
3.	4738 −1812	638 +825	5083 −1726	4607 −938

4. a. 28 + 84 + 70 **b.** $4.80 − $1.92

Write the answers to these questions:

5. Which is cheaper when one makes a long-distance telephone call, the day rate or the night rate?

6. How many feet are there in one mile?

7. What is the distance around any surface called?

8. How many pounds are there in one ton?

9. When we add money numbers, for which numbers do we write the dollar sign?

10. When we add money numbers, for which numbers do we write the decimal point?

11. How many different numbers can you make with the same two figures?

IMPROVE YOUR SKILLS

(Diagnostic Test 5)

Work each set of examples. If you miss more than one example in any set, you need to review. The number printed in heavier figures after the set tells you which page to review.

	a	b	c			d	e	f	
1.	50	60	80	**(130)**	2.	815	412	617	**(138)**
	×6	×7	×5			×6	×7	×4	
3.	367	485	928	**(140)**	4.	4)169	6)427	7)359	**(152)**
	×7	×3	×5						

HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 6)

Work these problems. Show all your work on your paper.

1. Clarence and his parents went on an automobile trip. These are the distances they drove the first three days: 278 miles, 347 miles, 406 miles. How far did they drive all together?

2. James bought a box of tools for $16.98. He gave the clerk $20.00. How much change should he have received?

3. How much will 6 dozen oranges cost if one dozen costs 64 cents?

4. Mrs. Smith bought 48 oranges. Her family ate the same number of oranges each morning. The oranges lasted 6 mornings. How many oranges were eaten each day?

5. Frank and his father had a rabbit farm. They had 328 rabbits. One day they sold 41 and another day 23. How many rabbits were left?

Turn to page 194.

6. Five boys in Miss True's room told how much money they each earned working on one Saturday. These are the amounts they earned: \$4.06, \$.90, \$3.20, \$.65, \$1.88. How much did the five boys earn all together?

7. Harry was the boy who earned \$4.06 while Tom earned \$.90. How much less than Harry did Tom earn?

8. Philip earned \$3.20 each Saturday that he worked. How much did Philip earn in six Saturdays?

9. Lucy earned \$12.50 helping a neighbor. She bought a sweater that cost \$6.80. How much of the money that she earned was left?

10. One Saturday Betty and her parents drove 197 miles. The next Saturday they went 386 miles. How far did they drive in the two days?

DO YOU LEARN AND REMEMBER?

(Progress Test 5)

1. Write the following:

a. A number with 7 in the hundreds' place

b. A number with 0 in the tens' place

c. A number with 1 in the thousands' place

d. A number with 9 in the ones' place

Copy these examples and write the answers:

	a	b	c	d
2.	18 +43	672 +519	\$2.59 +7.38	\$9.50 +.49
3.	600 800 300	49 67 13 92	\$.42 .38 .59 .76	418 492 367 504

	a	b	c	d
4.	4760	5638	$29.07	5423
	−3410	−742	−8.19	−1875
5.	40	91	18	88
	×3	×6	×7	×6
6.	14 ÷ 2	5 × 718	$\frac{1}{2}$ of 84	99 ÷ 3
7.	3)126	290	4)364	$2.82
		×4		×7
8.	$\frac{1}{3}$ of 69	5)155	6)78	4)92
9.	7)840	6)840	3)171	4)206

IS IT REASONABLE?

(Enrichment material)

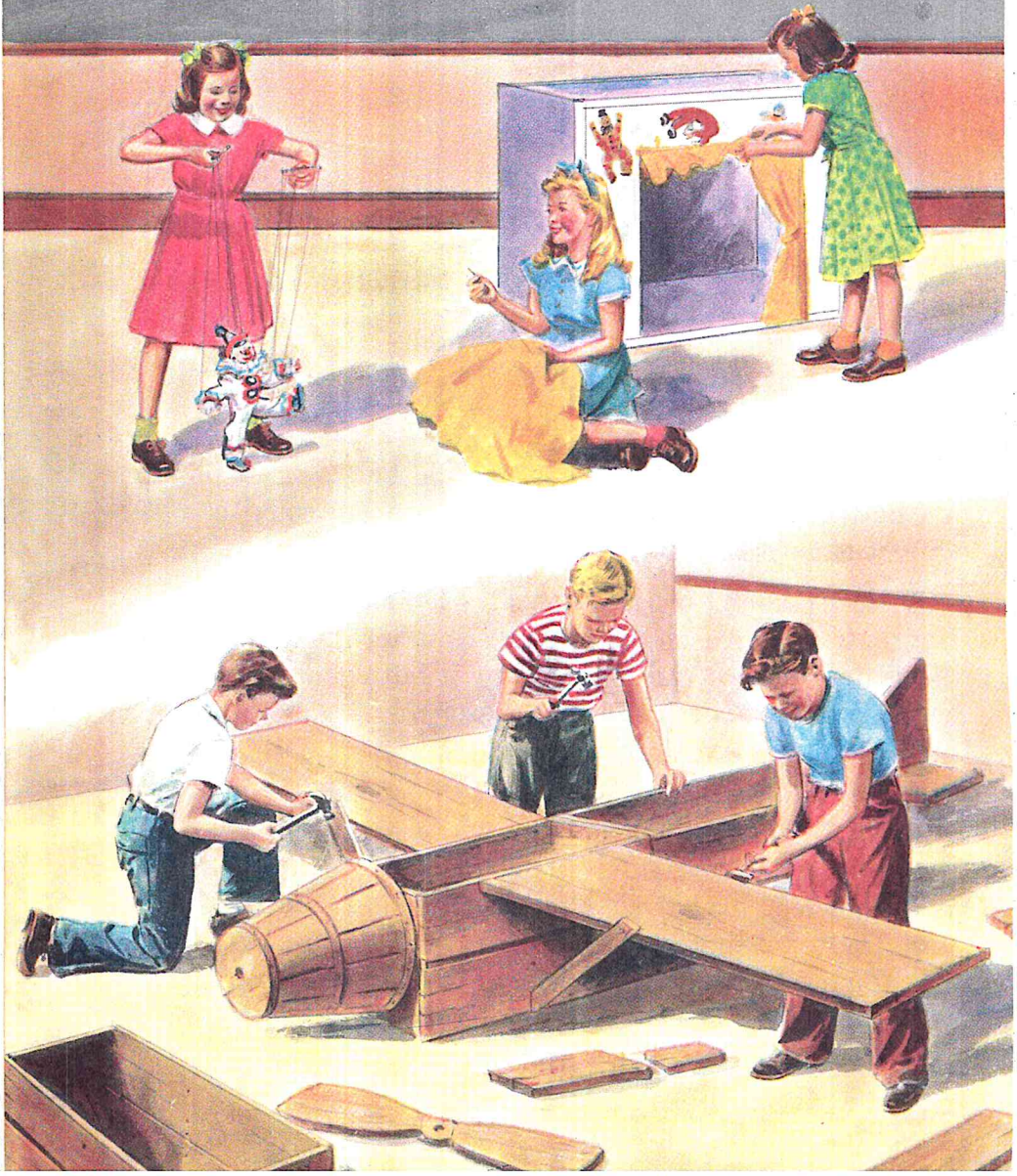
If what we say is reasonable, it could be true. It might not be true but it could be. If what we say could not be true, it is not reasonable.

Write the numbers 1 to 8 down the left side of your paper. If a sentence is reasonable, write YES after its number. If the sentence is not reasonable, copy it but change the number in it so that the sentence is reasonable.

1. John said, "My father has a billion dollars."
2. Mary's great-grandmother is 153 years old.
3. Ruth said that her grandmother was born in 1890.
4. Jean paid $175.00 for a new doll.
5. Sam rode his bicycle ten miles in one day.
6. Dick said that his father paid $52.00 for a new watch.
7. Tom fell from a tree 25 feet high but was not hurt.
8. Mr. King's automobile could go 85 miles an hour.

CHAPTER VII

Multiplying and Dividing the Eights and Nines



THE KINDERGARTEN ROOM

The boys and girls of the upper grades decided to make things for the kindergarten room. The boys decided to make a play airplane. The girls decided to make new curtains for the puppet stage in the kindergarten room. The picture shows the boys making the play airplane and the girls making the curtains.

1. The boys used orange crates. They bought four crates from the grocer and paid 18 cents for each. How much did the four crates cost?

2. They also used a peach basket, which cost 24 cents, and some plain boards, which they bought at the lumber yard for 68 cents. How much did the crates, basket, and plain boards cost all together?

3. The girls bought 5 yards of curtain material at 49 cents a yard. How much did this material cost?

4. The boys bought a can of orange paint for 13 cents, a can of red paint for 32 cents, and a can of blue paint for 13 cents. They bought a paint brush for 79 cents. How much did their paint and brush cost?

5. The girls paid 10 cents for needles, 16 cents for tape, 24 cents for thread, and 64 cents for hooks for the curtains. How much did these materials cost?

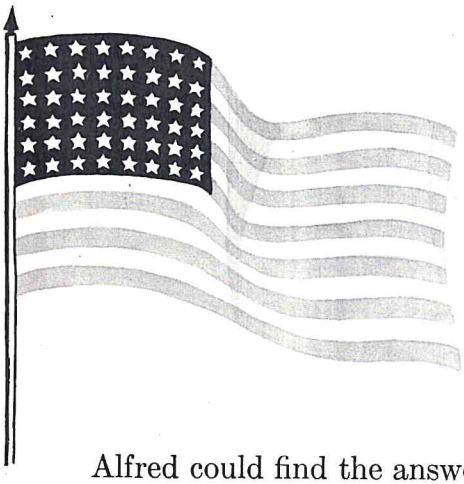
6. How much did the boys spend all together?

7. How much did the girls spend all together?

★**8.** The curtain material was 50 inches wide. The curtains were going to be 32 inches wide. Four inches had to be allowed for the hems. How much did the girls have to cut off the material?

★**9.** The class started with $11.19 in its treasury. After they paid all their bills, how much did they have left?

MULTIPLYING EIGHT



Alfred's teacher asked him how many stars there are in the flag. Alfred said, "I do not know but I can quickly count them."

Alfred counted the first row and said, "There are 8 stars in each row." He counted the rows and said, "There are six rows." He said: "Six times 8 stars equals 48 stars. There are 48 stars in the flag."

Alfred could find the answer quickly because he knew the multiplication facts for 8.

You should know the facts just below. Review them.

8	8	8	8	8	8	8	8
×0	×1	×2	×3	×4	×5	×6	×7
0	8	16	24	32	40	48	56

The two facts at the right are new. Make practice cards for them and study them.

8	8
×8	×9
64	72

	a	b	c
1.	Two 8's = ?	No 8's = ?	Seven 8's = ?
2.	Three 8's = ?	One 8 = ?	Six 8's = ?
3.	Five 8's = ?	Eight 8's = ?	Nine 8's = ?

4. How many are there all together if there are 8 rows of plants and 8 plants in each row?

HOW FAST DOES IT GO?

One way we use numbers is to tell how fast things travel. We often say how fast things travel by saying how many miles they can go in one hour. We say that a car can go fifty miles in one hour. We may write it this way: A car can go fifty **miles per hour.**

Find the answers to these questions by asking your parents and older brothers or sisters or your friends or by looking for the answers in other books. Write the answers.

1. How fast can a passenger train go?
2. How fast can an airplane go?
3. How fast can a man walk?
4. How fast may an automobile go in your city or town?
5. How fast can a horse walk?
6. How fast can a steamship go?
7. How fast can a boy ride a bicycle?

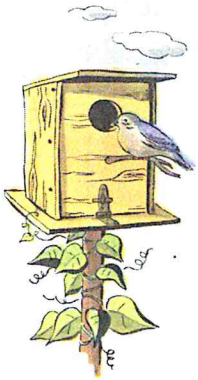
Time for Practice

Copy these examples and write the sums:

	a	b	c	d	e	f
1.	381	368	427	788	259	211
	375	305	982	187	276	999
2.	975	152	429	350	811	379
	496	763	218	857	389	172
3.	362	578	154	882	838	965
	684	171	987	757	886	159

MULTIPLYING BY EIGHT

The boys in Carl's class decided that they would make 8 birdhouses to put in the city parks. They made the birdhouses in their school shop. Their teacher helped the boys study the plans. They found that they needed the following things for each birdhouse:



2 pieces of plywood for top and bottom	1 latch
4 plain boards for the sides	8 screws
3 small hinges	6 small nails
	9 large nails

The boys decided to buy the materials for all 8 houses at one time. How many of each of the kinds of material named did they need? To answer this question, you have to know the multiplication facts for 8.

You have studied these multiplication facts. Write the products on separate paper:

8	8	8	8	8	8	8	8	8	8
×3	×1	×0	×6	×2	×4	×7	×5	×9	×8

These are the reverses. Be sure that you know all of them.

0	1	2	3	4	5	6	7	8	9
×8	×8	×8	×8	×8	×8	×8	×8	×8	×8
0	8	16	24	32	40	48	56	64	72

Write the number of each kind of thing needed for building the 8 birdhouses that the boys decided to make.

MULTIPLYING TWO-PLACE NUMBERS BY EIGHT

Copy these examples and write the products:

	a	b	c	d	e	f
1.	97	56	84	32	95	61
	×8	×8	×8	×8	×8	×8
2.	80	47	38	12	23	59
	×8	×8	×8	×8	×8	×8

Problem Practice

Work these problems. Show all your work on your paper.

1. Alice bought 8 party favors. The favors cost 24 cents each. How much did the 8 favors cost?

2. Donald found that there were 8 small panes of glass in each of the schoolroom windows. There were 86 windows in the schoolrooms. How many small panes of glass were there in all the schoolroom windows?

3. Miss Jensen bought a small balloon for each of the 28 pupils in her room. The balloons cost 7 cents each. How much did the 28 balloons cost?

4. Each of the pupils in Miss Hart's class brought 6 cents to school for a special writing tablet. If each of the 37 pupils brought 6 cents, how much money did they bring all together?

5. Mr. Crane had 69 boxes of crayons left to sell. There were 8 crayons in each box. How many crayons were there in the 69 boxes?

Time for Practice

Copy these examples and find the remainders:

	a	b	c	d	e
1.	438 19	746 58	$50.43 7.28	3510 192	5104 4008
2.	$37.19 8.40	1919 36	4056 827	4015 1607	$44.24 .56
3.	$.40 .08	8613 657	9036 100	$.87 .19	800 337

Did you check your answers?

Copy these examples and find the products:

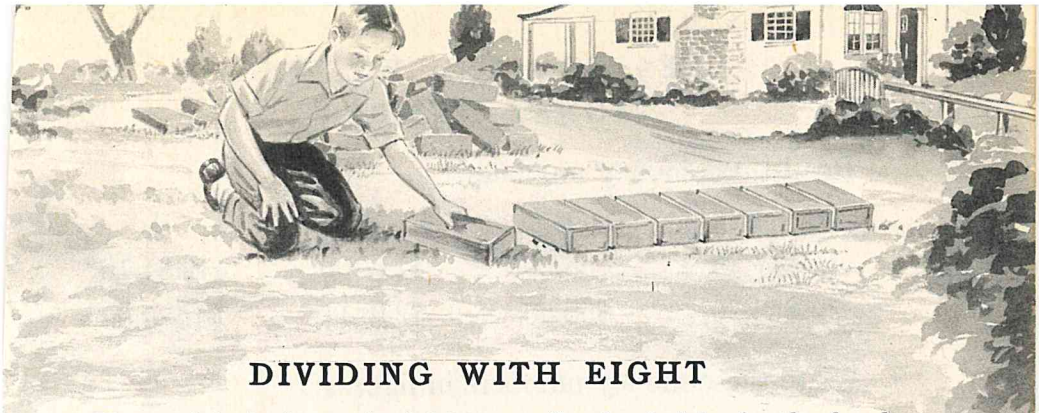
	a	b	c	d	e	f
4.	201 ×8	354 ×8	897 ×8	656 ×8	879 ×8	253 ×8
5.	143 ×8	401 ×8	528 ×8	776 ×8	104 ×8	923 ×8
6.	790 ×8	146 ×8	964 ×8	360 ×8	975 ×8	211 ×8

Hints for Better Work

1. Do you always copy accurately the example you are to work?

2. Do you always copy the example neatly?

3. When you write numbers in an example do you always keep ones under ones, tens under tens, and hundreds under hundreds?



DIVIDING WITH EIGHT

Kenneth's father asked him to pile the bricks in the back yard in an even row. Kenneth counted and found 56 bricks. He put 8 bricks side by side to start 8 piles.

Tell how many bricks Kenneth will put in each pile to use all 56 bricks. Draw a picture if it will help you.

How many bricks were there in each pile when Kenneth had used 24? 32? 40? 48? How many 8's are there in 24? 32? 40? 48?

Study the division facts for 8. Make practice cards for each fact that you are not sure of.

0	1	2	3	4	5	6	7	8	9
8)0	8)8	8)16	8)24	8)32	8)40	8)48	8)56	8)64	8)72

Study the facts that have 8 as a quotient. Make practice cards for each fact that you are not sure of.

8	8	8	8	8	8	8	8	8
1)8	2)16	3)24	4)32	5)40	6)48	7)56	8)64	9)72

Write the multiplication and division families for:

	a	b	c	d
1.	8, 2, 16	40, 5, 8	48, 8, 6	9, 8, 72
2.	3, 8, 24	56, 7, 8	4, 8, 32	1, 8, 8

READING AND WRITING MONEY NUMBERS

Read these money numbers:

	a	b	c	d
1.	$17.16	$95.00	$117.00	$484.10
2.	$43.76	$50.50	$346.11	$1480.00

Write these money numbers in figures:

3. Seventy-six dollars

4. Five hundred dollars and ten cents

5. One thousand dollars

6. Seven thousand, fifty dollars

When we write money numbers, we may omit the zeros after the decimal point if there are no cents. The money number $5.00 may be written this way: $5

7. Which money numbers in Exercises **1** to **6** show dollars only? Write these without zeros for cents.

Time for Practice

Copy these examples and write the sums:

	a	b	c	d	e
1.	$7.95 4.54	$4.37 1.70	$1.77 8.58	$4.89 4.74	$2.70 4.69
2.	118 796	474 528	375 595	756 596	979 652
3.	$8.96 4.24	$6.72 5.69	$5.61 3.56	$9.95 5.15	$7.56 4.67

UNEVEN DIVISION BY EIGHT

Tim had seven boys at his birthday party. The eight boys were dropping beans in a bottle. There were 50 beans. If each boy had the same number of beans, how many beans could each boy have with the fewest number of beans left over?

You can find the answer by division. $50 \div 8 = 6$ with 2 left over. Use beans, kernels of corn, chalk, or sticks to show that this is the correct answer.

1. Copy these numbers and put circles around the helpers for dividing by 8:

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79

2. Beginning with 10, divide by 8 all the numbers above that end in 0, 1, 2, 3, or 4.

3. Beginning with 15, divide by 8 all the numbers above that end in 5, 6, 7, 8, or 9.

4. Each boy dropped his beans five times. These are the numbers each one got in the bottle. Tell how many beans each boy got in the bottle all together. Who won?

a. Bob: 4, 2, 0, 3, 4
b. Harry: 1, 3, 2, 1, 5
c. Jim: 0, 2, 2, 4, 3
d. Mac: 2, 2, 4, 4, 5
e. Clem: 1, 0, 1, 2, 1
f. Phil: 2, 2, 1, 3, 4
g. John: 2, 3, 4, 5, 5
h. Tim: 1, 1, 0, 4, 4

HENRY MAKES A MISTAKE

(Broken columns in adding)

Henry kept track of the speedometer reading on his father's car for four days. This was the number of miles that the car went each day: 59, 8, 207, 83. Henry added to find how far the car had gone in the four days. The example at the right shows how he wrote the numbers. Henry said the car had gone 2427 miles.

Henry's Mistake

```
 59
  8
207
 83
----
2427 miles
```

Henry made a mistake. He did not keep the figures in the ones', tens', and hundreds' columns under one another. He should have placed the numbers as they are placed at the right. The correct answer is 357 miles.

The Right Way

```
 59
  8
207
 83
----
357 miles
```

When we add, ones must be under ones, tens under tens, and hundreds under hundreds.

Copy these examples and add:

	a	b	c
1.	11, 21, 143, 7	62, 8, 619, 3	3041, 89, 873, 2
2.	88, 9, 2046, 17	11, 5148, 16	7, 19, 38, 302
3.	15, 5, 652, 1400	9146, 74, 407, 43	23, 6, 7006

COUNTING SAVINGS

Marie and Fred decided to count the money in their savings bank. Answer these questions about their money:

1. Fred counted 8 dimes. How much money was this? Write this money number two ways.

2. Marie counted 7 quarters. How much money was this?

3. Marie counted 27 nickels. How much money was this?

4. How much money was there all together in nickels, dimes, and quarters?

5. There were 48 pennies and one half-dollar in the bank. How much money was there all together in the bank?

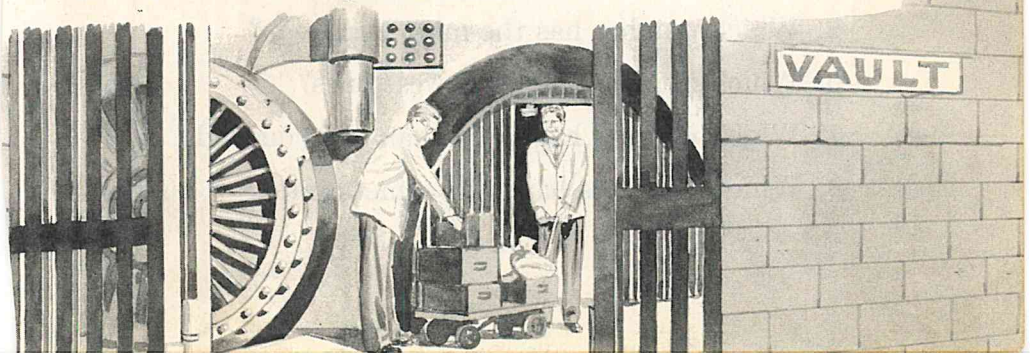
6. If Fred and Marie shared the money equally, how much did each get?

Farmers, merchants, and other businessmen put their money in banks. These banks are business places. People put their money in banks because it is safe and convenient.

7. Look up **banks** in other books and make a report on what you find.

8. Why are banks "safe" and "convenient" places for money?

9. If your father has money in a bank, find out from him why he puts his money in a bank.



Time for Practice

Copy these examples and find the quotients:

	a	b	c	d	e	f
1.	$8\overline{)17}$	$8\overline{)49}$	$8\overline{)59}$	$8\overline{)34}$	$8\overline{)65}$	$8\overline{)72}$
2.	$8\overline{)68}$	$8\overline{)25}$	$8\overline{)41}$	$8\overline{)56}$	$8\overline{)15}$	$8\overline{)73}$
3.	$8\overline{)47}$	$8\overline{)67}$	$8\overline{)29}$	$8\overline{)20}$	$8\overline{)48}$	$8\overline{)79}$
4.	$2\overline{)13}$	$4\overline{)33}$	$7\overline{)48}$	$6\overline{)36}$	$8\overline{)42}$	$5\overline{)37}$
5.	$6\overline{)50}$	$8\overline{)11}$	$5\overline{)44}$	$2\overline{)17}$	$3\overline{)15}$	$7\overline{)22}$
6.	$4\overline{)9}$	$3\overline{)26}$	$7\overline{)58}$	$8\overline{)24}$	$6\overline{)13}$	$8\overline{)74}$
7.	$8\overline{)168}$	$8\overline{)248}$	$8\overline{)96}$	$8\overline{)416}$	$8\overline{)544}$	$8\overline{)792}$
8.	$8\overline{)184}$	$8\overline{)296}$	$8\overline{)352}$	$8\overline{)536}$	$8\overline{)608}$	$8\overline{)624}$
9.	$8\overline{)88}$	$8\overline{)752}$	$8\overline{)392}$	$8\overline{)408}$	$8\overline{)664}$	$8\overline{)856}$

Reviewing Place Value

1. Read these numbers:

   4076 6302 5840 2007 43,308

2. Which of the numbers that you just read have 0 in the tens' place? in the hundreds' place?

3. Which number has 4 in the thousands' place?

4. Which number has 2 in the ones' place?

5. Which number has the most hundreds?

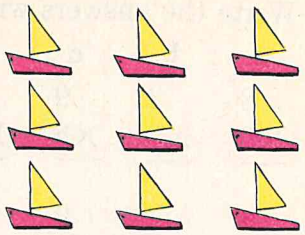
6. Which number has the fewest ones?

7. Which number has more than 10 thousands?

8. Which numbers have the same number of hundreds?

MULTIPLYING WITH NINE

Marie drew a picture of nine boats. Then she drew a second picture like the first one. How many boats were there in the two pictures? How many would there be if Marie drew 3 pictures? 4? 5? 6? 7? 8? 9?



You know that the way to find the answers is to multiply. You can also add. If you need to, you can draw pictures as Marie did.

You have already learned these facts just below. Review them now.

9	9	9	9	9	9	9	9	9
×0	×1	×2	×3	×4	×5	×6	×7	×8
0	9	18	27	36	45	54	63	72

The multiplication fact on the right is the new multiplication fact to learn. Make a practice card for it and study it.

9
×9
81

These are the reverses of the multiplication facts above. Be sure that you know them.

0	1	2	3	4	5	6	7	8	9
×9	×9	×9	×9	×9	×9	×9	×9	×9	×9
0	9	18	27	36	45	54	63	72	81

1. How many are three 9's? nine 3's?
2. How many are four 9's? nine 4's?
3. Beginning with 9, count by 9's to 81.

Do It Quickly

Write the answers without copying the examples:

	a	b	c	d	e	f	g	h	i
1.	8	3	9	8	5	6	2	2	9
	×6	×9	×8	×9	×8	×9	×8	×9	×2
2.	9	7	9	4	9	9	7	8	8
	×5	×8	×7	×9	×6	×4	×9	×8	×3
3.	9	4	8	8	8	3	9	5	6
	×9	×8	×5	×4	×7	×8	×3	×9	×8

The Nines Are Interesting

The tables of 9's are printed below:

a	b
$0 \times 9 = 0$	$9 \times 0 = 0$
$1 \times 9 = 9$	$9 \times 1 = 9$
$2 \times 9 = 18$	$9 \times 2 = 18$
$3 \times 9 = 27$	$9 \times 3 = 27$
$4 \times 9 = 36$	$9 \times 4 = 36$
$5 \times 9 = 45$	$9 \times 5 = 45$
$6 \times 9 = 54$	$9 \times 6 = 54$
$7 \times 9 = 63$	$9 \times 7 = 63$
$8 \times 9 = 72$	$9 \times 8 = 72$
$9 \times 9 = 81$	$9 \times 9 = 81$

Look at Columns **a** and **b**. What is interesting about each product? Do the two figures in each product add to 9?

Look at Column **b**. Is the first figure of the product always 1 less than the number multiplied? Look at $9 \times 7 = 63$. You see that 6 and 3 = 9. You also see that 6 is 1 less than 7. Does this work for every fact?

MULTIPLYING TWO-PLACE NUMBERS BY EIGHT AND NINE

(Carrying without bridging)

Copy these examples and write the products:

	a	b	c	d	e	f	g	h
1.	22	24	53	33	64	88	62	74
	×9	×8	×9	×9	×9	×9	×8	×8
2.	37	72	44	85	73	87	55	87
	×8	×8	×9	×8	×8	×9	×9	×8
3.	35	98	86	66	46	99	73	99
	×8	×8	×8	×9	×8	×8	×9	×9
4.	92	76	94	97	59	98	58	86
	×9	×9	×8	×9	×8	×9	×8	×9

Time for Practice

Copy these examples and find the differences. Check by adding.

	a	b	c	d	e	f
1.	656	124	7932	857	437	768
	187	46	3769	76	231	98
2.	469	654	753	500	987	9235
	85	372	96	72	565	784
3.	381	634	8573	6055	768	5479
	345	473	7622	2828	102	863
4.	629	988	707	5060	7480	948
	522	13	467	3461	603	819

IS IT MORNING OR AFTERNOON?

There are 24 hours in each day, but our clocks show only 12 hours. In order to show in writing which part of the day we mean, we use the letters A.M. and P.M.

The letters A.M. mean **before noon.** The letters P.M. mean **afternoon.** If your school starts at nine o'clock in the morning, it starts at **9:00** A.M. If your father comes home from his work at half-past five in the evening, he comes home at **5:30** P.M.

We write time numbers so that the first number shows the hour and the second number the number of minutes after the hour. When we write 9:20 we mean 20 minutes after 9. When we write 10:45 we mean 45 minutes after 10. We also mean 15 minutes before 11. Can you tell why? Tell how you would write 20 minutes **before** 3. Draw a clock picture to show this.

When it is exactly twelve o'clock we must write **12:00 Noon** or **12:00 Midnight.**

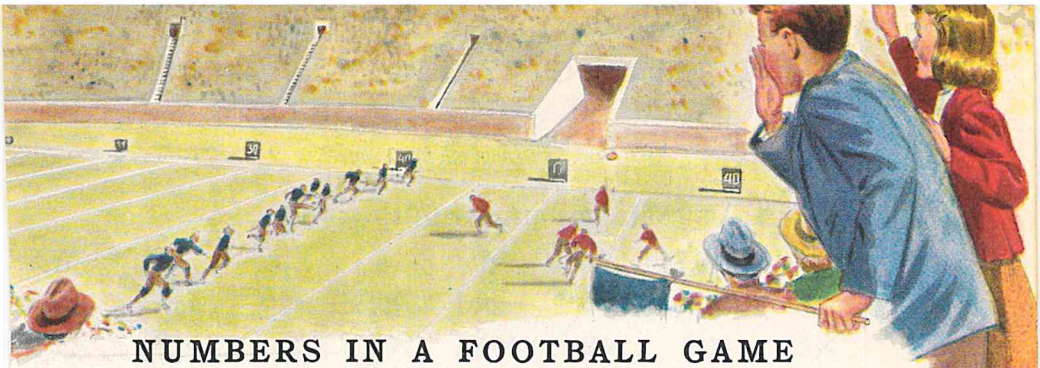
Write the time for each of the following:

1. Twenty minutes before ten in the morning
2. Eleven o'clock at night
3. One hour after midnight
4. Fifteen minutes before noon
5. Forty-five minutes before midnight

Time for Practice

Copy these examples and write the sums:

a	b	c	d	e	f	g
46	87	93	85	40	30	75
35	23	38	74	38	27	60
46	43	34	35	67	67	68



NUMBERS IN A FOOTBALL GAME

1. Each team in a football game has eleven players. How many players will there be on the two teams that play?

2. The football field is 100 yards long and 60 yards wide. How many feet long and how many feet wide is the field?

3. A good football player sometimes kicks the ball 40 yards. How many feet is that?

4. Sometimes as many as 60,000 people attend a football game. Read this number.

5. If a family of four paid $3.00 each to attend a football game, how much money did the family pay for the tickets?

6. The government received 50 cents from each $3.00 ticket. How much did the government receive for the four tickets?

7. How much did the school receive after the government has taken its share for the four tickets?

People Pay Taxes

The money that the government receives when football tickets are sold is called a **tax.** People also pay taxes on their incomes, and there are many other taxes.

1. Name other things on which people pay taxes.

2. Ask your father or some other older person about the taxes that are paid for driving a car, for gasoline, and for the telephone. Write the amounts of the taxes and bring the list to school.

MULTIPLYING BY EIGHT AND NINE WITH HARDER CARRYING

(Carrying with bridging)

Copy these examples and write the products:

	a	b	c	d	e	f	g	h
1.	26	38	49	28	34	39	24	47
	×8	×8	×9	×8	×9	×8	×9	×9
2.	38	27	35	23	48	29	57	27
	×9	×8	×9	×9	×9	×8	×9	×9
3.	25	36	28	58	26	64	37	68
	×9	×9	×9	×9	×9	×8	×9	×8
4.	67	68	39	46	67	65	69	66
	×8	×9	×9	×9	×9	×8	×8	×8
5.	59	69	78	79	88	76	89	77
	×9	×9	×9	×9	×8	×8	×8	×8

Do It Quickly

✶ Write the answer to each of these examples without copying the example. Think the answer; then write it.

	a	b	c	d
1.	15 + 5	2 × 12	9 × 0	100 + 1
2.	90 − 10	47 + 7	15 ÷ 3	47 − 37
3.	16 ÷ 2	36 ÷ 6	2 × 50	21 ÷ 7
4.	9 × 10	77 − 7	64 + 9	10 × 7
5.	20 − 0	8 + 23	100 − 2	48 ÷ 8

Writing does not take the place of thinking. We must think whenever we work arithmetic examples.

ANOTHER WAY TO COUNT

(Ordinal numbers)

Are you in the **fourth** grade? If so, you have been promoted from the **first, second,** and **third** grades.

When we count the grades in school we do not count by saying: one grade, two grade, three grade, four grade. We say: first grade, second grade, third grade, fourth grade, fifth grade, sixth grade. This is another way to count.

When we want to show the **position** of something among a group of things we may count: first, second, third, and so on. When we want to know **how many** there are in a group of things all together we count: one, two, three, and so on.

1. Read these numbers from first to twentieth:

First, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, eleventh, twelfth, thirteenth, fourteenth, fifteenth, sixteenth, seventeenth, eighteenth, nineteenth, twentieth

We use the numbers over again above **twentieth** just as we use them over again above twenty. We say: twenty-first, twenty-second, twenty-third, twenty-fourth, and so on, thirty-first, thirty-second, and so on.

2. Count from twentieth to fiftieth.

3. Count from seventieth to ninety-ninth.

4. Count backward from twentieth to first.

5. Count backward from seventieth to fiftieth.

6. Beginning with tenth, count by tens to ninetieth.

7. Beginning with fifth, count by fives to fiftieth.

8. You know we use numbers that show position to name the grades in school. Tell three other ways in which we use these numbers.

Time for Practice

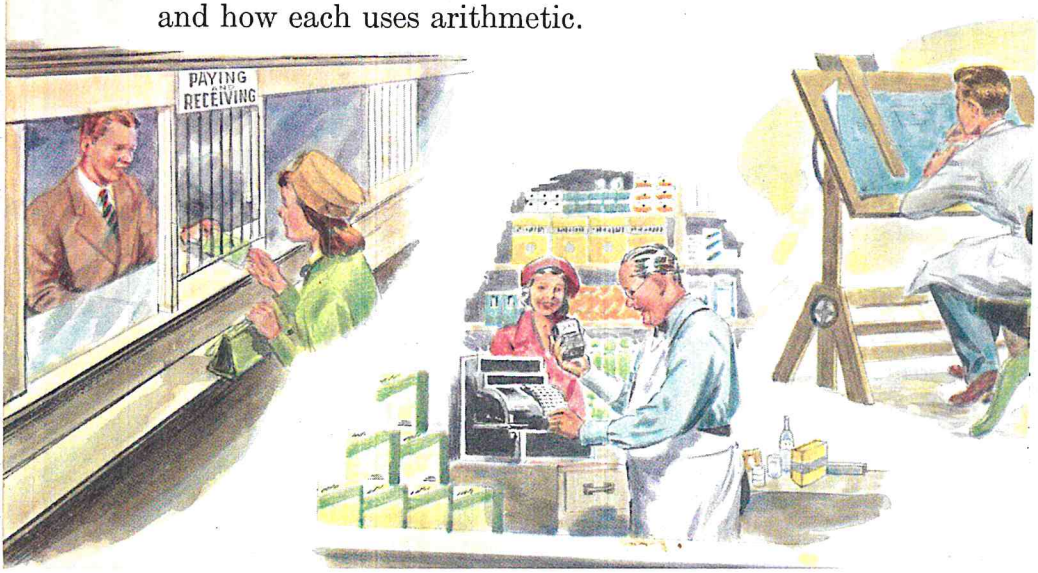
Copy these examples and write the sums. Be sure to check your work.

	a	b	c	d	e	f
1.	625	151	790	276	970	636
	314	102	477	300	965	138
	937	153	382	276	973	408
2.	521	438	836	769	457	260
	532	890	829	360	382	548
	523	420	824	761	145	801
3.	2	5	248	94	843	702
	74	908	347	350	17	82
	846	723	91	226	38	9
	5	79	5	63	809	53

Arithmetic in Business

1. Do you have a father, a brother, or an uncle who is a businessman? If you do, tell the others in the class how he uses arithmetic.

2. Tell what each of the men in the pictures below does and how each uses arithmetic.



Time for Practice

Copy these examples and find the remainders. Check your work.

	a	b	c	d	e
1.	9822	742	3224	7632	473
	4045	296	79	1878	396
2.	992	711	6958	6587	7948
	134	687	1765	4468	2853
3.	912	7884	875	52	614
	599	5889	779	5	317

Copy these examples and find the products:

	a	b	c	d	e	f
4.	120	437	889	965	712	406
	×9	×9	×9	×9	×9	×9
5.	182	855	634	179	302	107
	×9	×9	×9	×9	×9	×9
6.	467	853	290	814	369	677
	×9	×9	×9	×9	×9	×9

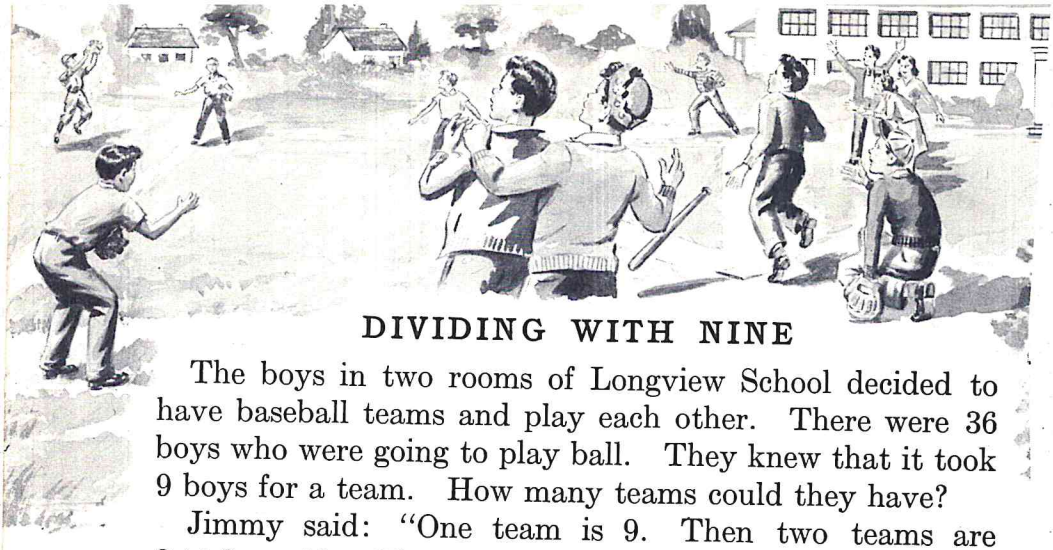
Did you check your products? How?

Reading and Writing Fractions

1. Read each of these fractions aloud:

$\frac{1}{2}$ $\frac{1}{4}$ $\frac{2}{3}$ $\frac{1}{6}$ $\frac{1}{3}$ $\frac{3}{4}$ $\frac{1}{8}$

2. Write a sentence using each fraction. One of your sentences may read like this: I bought $\frac{1}{2}$ pound of butter for the picnic.



DIVIDING WITH NINE

The boys in two rooms of Longview School decided to have baseball teams and play each other. There were 36 boys who were going to play ball. They knew that it took 9 boys for a team. How many teams could they have?

Jimmy said: "One team is 9. Then two teams are 2×9, or 18. Three teams are 3×9, or 27. Four teams are 4×9, or 36. We can have 4 teams."

If you remember that this is a division example, you can find the number of teams in an easier way.

36 boys are to be divided into groups of 9.

$$36 \div 9 = 4$$

To divide by 9, we must know the division facts for 9. Be sure that you know these division facts for 9:

0	1	2	3	4	5	6	7	8	9
9)0	9)9	9)18	9)27	9)36	9)45	9)54	9)63	9)72	9)81

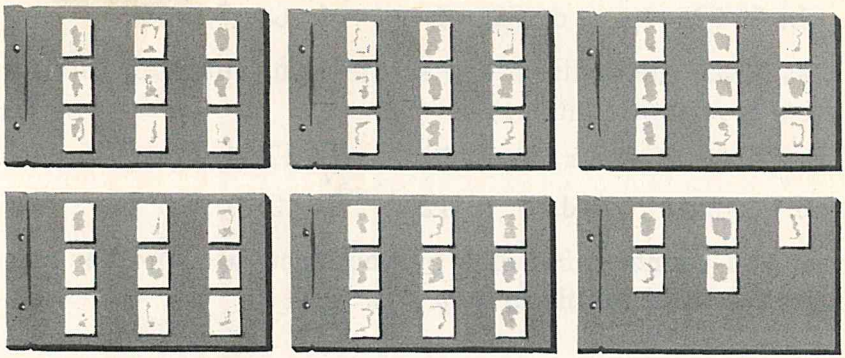
These are the facts with 9 as a quotient. Be sure that you know them.

9	9	9	9	9	9	9	9	9
1)9	2)18	3)27	4)36	5)45	6)54	7)63	8)72	9)81

1. How many 9's are there in 18? 36? 63? 81?
2. How many 9's are there in 27? 45? 54? 72?

UNEVEN DIVISION BY NINE

Susan was pasting pictures in her picture album. She put 9 pictures on each page. She had 50 pictures. This is how Susan arranged them:



How many pages of 9 each did Susan have? How many pictures were left over? Write this story as a division example. What is the quotient? What is the remainder?

1. Copy these numbers and draw circles around the helpers for dividing by 9:

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89

2. Beginning with 10, divide by 9 all the numbers that begin with 1, 3, 5, or 7.

3. Beginning with 20, divide by 9 all the numbers that begin with 2, 4, 6, or 8.

Reviewing Number Families

1. Make the multiplication and division family for each of these groups of numbers:

a. 3, 9, 27	**c.** 2, 18, 9	**e.** 45, 9, 5
b. 8, 72, 9	**d.** 36, 4, 9	**f.** 63, 7, 9

2. Make the addition and subtraction family for each of these groups of numbers:

a. 2, 6, 8	**c.** 9, 7, 16	**e.** 12, 4, 8
b. 5, 6, 11	**d.** 3, 9, 12	**f.** 9, 5, 4

If you cannot think of a number fact, use another fact from the same family to help you.

Do It Quickly

Write only the quotients for these examples:

	a	b	c	d	e	f
1.	$9\overline{)9}$	$3\overline{)27}$	$9\overline{)54}$	$9\overline{)0}$	$1\overline{)9}$	$4\overline{)36}$
2.	$2\overline{)18}$	$9\overline{)18}$	$5\overline{)45}$	$9\overline{)27}$	$7\overline{)63}$	$9\overline{)72}$
3.	$9\overline{)63}$	$6\overline{)54}$	$9\overline{)36}$	$9\overline{)45}$	$9\overline{)81}$	$8\overline{)72}$

Without Paper and Pencil

2 0 7 3 9 6 5 1 8 4

1. Multiply each number in the row above by 8 and add 7.

2. Multiply each number by 9 and add 8.

3. Multiply each number by 8 and add 5.

4. Multiply each number by 9 and add 6.

5. Choose from the row of numbers above two numbers that are not used in Exercises **1** to **4.** Multiply each of the numbers in the row above by the larger number you chose and add the smaller.

REVIEWING ARITHMETIC WORDS

Number the lines on a sheet of paper from 1 to 12. Write after the number of each of the following sentences the word that should go where the question mark is.

1. When we multiply a one-place number by 10 the product is that number in the tens' place and —?— in the ones' place.

2. Zero divided by a number equals —?—.

3. Indians sometimes used beads or shells for money. This was called —?—.

4. We make money out of metal or —?—.

5. Numbers like 7, 2, or 8 are called —?— numbers.

6. When we divide and have a remainder we call the division —?—.

7. A surface with three sides is called a —?—.

8. The distance around a surface such as a triangle or a rectangle is called the —?—.

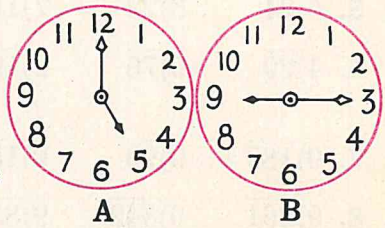
9. When we put together or combine groups of different sizes we must —?—.

10. When we take part of a group away we —?—.

11. The shortest way to change a large group into smaller groups, all of the same size, is to —?—.

12. The shortest way to put together or combine groups that are all of the same size is to —?—.

What Time Is It?



1. Clock **A** shows what time?

2. Clock **B** shows what time?

3. Can you tell whether it is A.M. or P.M. by the clocks?

4. Draw clock faces to show these times: 6:00, 12:00, 9:25, 5:45, 8:30.

Do It Quickly

Write only the answers to these examples:

1. How many 7's are there in	49?	21?	63?	28?
2. How many 8's are there in	40?	64?	16?	56?
3. How many 4's are there in	12?	36?	32?	24?
4. How many 6's are there in	12?	30?	54?	36?
5. How many 5's are there in	40?	10?	35?	5?
6. How many 8's are there in	72?	8?	48?	24?
7. How many 7's are there in	14?	35?	7?	42?

Time for Practice

Copy these examples and find the answers:

	a	b	c	d	e	f
1.	$9\overline{)31}$	$9\overline{)19}$	$9\overline{)46}$	$9\overline{)22}$	$9\overline{)50}$	$9\overline{)62}$
2.	$9\overline{)10}$	$9\overline{)17}$	$9\overline{)32}$	$9\overline{)41}$	$9\overline{)43}$	$9\overline{)61}$
3.	$9\overline{)84}$	$9\overline{)63}$	$9\overline{)77}$	$9\overline{)81}$	$9\overline{)64}$	$9\overline{)74}$
4.	$6\overline{)49}$	$2\overline{)10}$	$8\overline{)74}$	$3\overline{)14}$	$6\overline{)42}$	$9\overline{)47}$
5.	$5\overline{)24}$	$3\overline{)22}$	$7\overline{)15}$	$4\overline{)36}$	$8\overline{)56}$	$5\overline{)47}$
6.	$4\overline{)29}$	$9\overline{)76}$	$2\overline{)19}$	$9\overline{)65}$	$7\overline{)28}$	$8\overline{)68}$
7.	$9\overline{)189}$	$9\overline{)99}$	$9\overline{)153}$	$9\overline{)603}$	$9\overline{)657}$	$9\overline{)846}$
8.	$9\overline{)261}$	$9\overline{)342}$	$9\overline{)837}$	$9\overline{)594}$	$9\overline{)558}$	$9\overline{)468}$
9.	$9\overline{)315}$	$9\overline{)756}$	$9\overline{)243}$	$9\overline{)459}$	$9\overline{)576}$	$9\overline{)819}$

"YES" OR "NO" QUESTIONS

(Class discussion)

Answer, "Yes," or, "No." Explain your answer.

1. Is a pair more than a dozen?
2. Are a few cookies more than a dozen cookies?
3. Does a chicken lay a dozen eggs a day?
4. Are 5 quarts of milk more than a gallon of milk?
5. Do birds ever fly a thousand miles an hour?
6. Do a million people ever live in one city?
7. Can a man walk 3 miles in one hour?
8. Do diamonds cost more than coal?
9. Does a pint of something always weigh a pound?
10. Can a man ever lift 100 pounds of sugar?
11. Are buildings ever a mile high?
12. Do babies ever weigh 100 pounds?
13. Are silver dollars worth more than paper dollars?
14. Is money ever made of metal?
15. Are there more hours in a day than there are days in a month?
16. Does any man ever own a million dollars?
17. Are all squares the same size?
18. Can a circle be larger than a square?
19. Are all figures with four sides square?
20. Do automobiles sometimes weigh a ton?
★**21.** Write one "yes" and one "no" question to ask in class. You should know the answer to each question.

Without Paper and Pencil

1. Add 7 to each of these numbers:

4 11 19 24 36 48 54 63 81

2. Add each of these numbers to those above: 9, 3, 8

Problem Practice

Work these problems. Show all your work on your paper. You will have to find one answer before you find the answer that the problem asks you to find.

1. Harold had 60 chickens. Twenty were black and 17 were brown. The rest were white. How many white chickens did Harold have?

2. Dick bought a new fountain pen that cost $1.25. He bought a bottle of ink that cost $.15. Dick had $2. How much did he have left after he had paid for the pen and the ink?

3. Phyllis had 105 new stamps for her stamp collection. She gave 13 of them to her brother Dan and 16 to her sister Ann. How many of her 105 stamps were left?

4. A bus running between two cities can make a round trip in 3 hours. How many round trips can the bus make from 3 o'clock in the afternoon to 9 o'clock in the evening?

IT IS INTERESTING TO DIVIDE BY THREE

(*Enrichment material*)

1. Which of these numbers can be divided by 3 without a remainder? 18, 37, 42, 50, 79, 99

2. Write four other two-place numbers that can be divided evenly by 3 and four that cannot.

3. Add the two figures of each of those numbers in Exercises **1** and **2** that can be divided evenly by 3. (**Example:** 42 can be divided evenly by 3. $4 + 2 = 6$)

4. What do you find interesting about these sums? Can the sum always be divided by 3? Write a sentence that tells this.

HOW MUCH HAVE YOU LEARNED?

(Chapter Test 7)

Copy these examples and write the answers:

	a	b	c	d	e
1.	8)25	9)19	9)65	8)18	9)46
2.	8)63	9)80	8)44	9)88	8)70
3.	16 ×8	29 ×9	50 ×8	27 ×8	54 ×9
4.	18 ×9	67 ×9	34 ×8	70 ×9	89 ×8

IMPROVE YOUR SKILLS

(Diagnostic Test 6)

Work each set of examples. If you miss more than one example in any set, you need to review.

	a	b	c	
1.	$3.00 ×7	$3.86 ×4	$5.18 ×6	(141)
3.	318 +437	625 +719	436 +846	(17)
4.	$4.39 +6.15	$7.50 +8.50	$3.98 +1.98	(174)
5.	$ 3.79 .68 14.00 5.45	$13.10 4.15 .75 .98	$ 6.50 49.50 8.29 3.60	(182)

	d	e	f	
2.	23 54 71 41	62 30 93 22	44 30 23 60	(168)

HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 7)

Work these problems. Show all your work on your paper.

1. Harry bought eight wooden boxes from his grocer for 16¢ each. How much did the eight cost?

2. Roger's class had $16.27 in its treasury. The class paid $.89 for food for a party. How much was left in its treasury?

3. Jim painted the dog house for his dog Blackie. He paid 28 cents for red paint and 65 cents for white paint. He bought a brush that cost 98 cents. How much did the paint and brush cost?

4. Tom earned $5.85 working after school. He worked 9 afternoons and earned the same amount each afternoon. How much did he earn each afternoon?

5. Phyllis bought a doll house that cost $5.25. Furniture for it cost $3.76. How much did the house and furniture cost together?

6. These are the distances Mr. Mason's car traveled the first five days last week: 27, 402, 81, 5, and 109. How far did the car go in the five days?

7. The boys of a scout troop decided to form baseball teams. There were 32 boys. There are 9 boys on a baseball team. How many teams could the troop have and how many boys would be left over?

8. There were 8 boys in each patrol of the scout troop. How many patrols were there?

9. Each boy in the troop brought 7¢ each month for troop dues. How much did the troop receive as dues each month from all the boys together?

10. Don saved $40.00 for a new bicycle. Then he found a good used one for $17.95. He bought the used bicycle. How much of his $40.00 was left?

DO YOU LEARN AND REMEMBER?

(Progress Test 6)

Copy these examples and write the answers:

	a	b	c
1.	$24 \div 4$	5×6	8×0
2.	$42 \div 7$	9×9	$14 \div 2$
3.	$72 \div 9$	7×4	8×8
4.	$30 \div 6$	6×8	$9 \div 9$

	a	b	c	d
5.	$\$4.98 + 2.81$	$532 - 118$	842×5	$6\overline{)38}$
6.	400 600 800	47 213 9	$\$.08 + .03$	Subtract: 409 99
7.	90×6	$7\overline{)81}$	16×7	72×8
8.	$9\overline{)47}$	$7\overline{)289}$	$6\overline{)426}$	395×7

9. $\frac{1}{2}$ of 6 pennies = —?— $\frac{1}{3}$ of 9 books = —?—

10. Write these numbers in words:

    803 5807 9300 4080

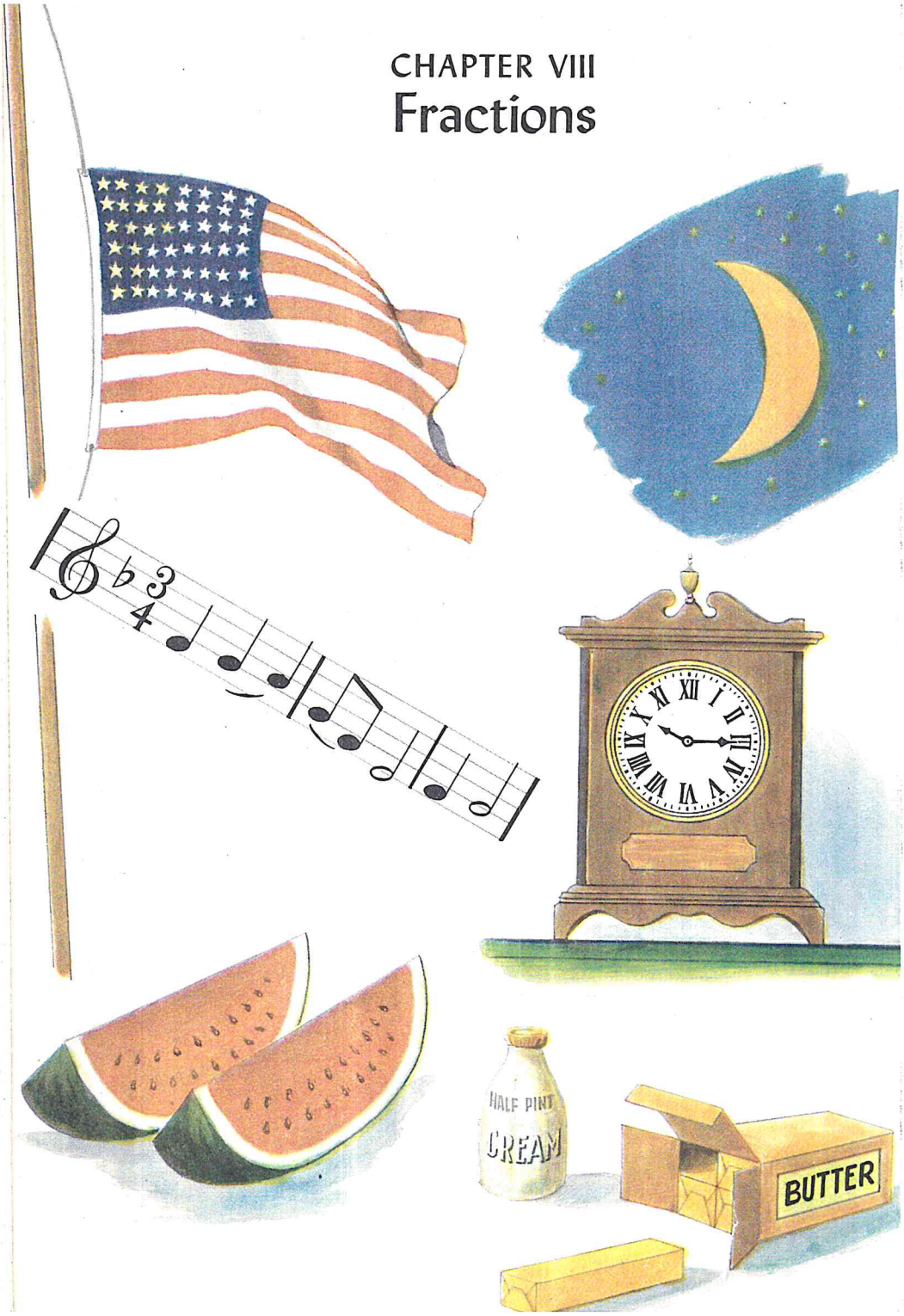
11. Write these numbers with Arabic numbers:

    IX XVII XIX IV XIII

12. Write the answers to these questions:

    a. How many seconds are there in one minute?
    b. Which month can have only 28 days?
    c. Is time before noon called A.M. or P.M.?

CHAPTER VIII
Fractions



USING FRACTIONS

In our writing and in our talking we often use fractions or words that mean fractional parts. The sentences below show ways in which we use fractions.

I go to school at half past eight.

The clock struck at a quarter past ten.

Jim's father gave him a dog which was half-grown.

The flag flies at half-mast.

The moon is at the first quarter.

I will meet you halfway.

He paid a quarter for the ball.

The toy cost a half dollar.

1. Write five sentences like those above in which you use a word that is a fraction or means a fractional part.

2. Read these fractions aloud: $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{3}$, $\frac{1}{3}$, $\frac{3}{4}$

3. Write in words the fractions that you have just read.

4. Explain what we mean by half notes and quarter notes in music.

5. Which is more, one fourth or one third of a pie?

6. Which is less, one third or one half of an apple?

7. Would you rather have a half dollar or sixty cents? Tell why.

8. Would you rather have a quarter of a dollar or twenty cents? Tell why.

9. How many minutes are there in a half-hour?

10. Which is more, one half or two thirds of an orange?

11. Tell what fraction is shown by each picture on the opposite page.

WHAT FRACTIONS MEAN

$\frac{1}{2}$	$\frac{1}{4}$	$\frac{2}{3}$	$\frac{2}{4}$
One half	**One fourth**	**Two thirds**	**Two fourths**

1. Which fraction above tells how much of each of these figures is shaded?

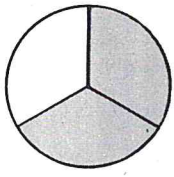
a **b** **c** **d** **e** **f** **g**

Did you notice that fractions have two numbers? When we write a fraction in figures one number is above the line and one number is below the line.

The part of the fraction below the line, as the 2 in $\frac{1}{2}$ or the 4 in $\frac{1}{4}$, tells into how many equal parts the whole is divided. We may say that it names the parts.

The part of the fraction above the line, as the 1 in $\frac{1}{2}$ or the 2 in $\frac{2}{3}$, tells how many of the equal parts are used.

2. Write the fraction above that tells how much of this circle is shaded. Which part of the fraction tells into how many equal parts the circle is divided? Which part of the fraction tells how many parts of the circle are shaded?

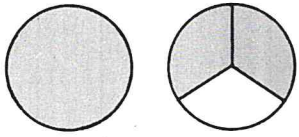


3. Draw a rectangle and shade one half of it.

4. Draw a rectangle and shade two thirds of it.

Sometimes we have a whole number and a fraction together. We may buy $1\frac{1}{2}$ dozen eggs, $3\frac{1}{2}$ pounds of apples, or $2\frac{1}{4}$ yards of cloth. We read these **mixed numbers** this way: one and one half, three and one half, two and one fourth

5. What mixed number does this picture stand for?



6. Draw squares that show $1\frac{2}{4}$.

7. Draw circles that show $1\frac{1}{3}$.

What Fraction Is Missing?

Write the fractions that belong where the question marks are:

1. I am going to cut this apple into two equal pieces. You may have one of the parts. You may have —?— of the apple.

2. The book cost fifty cents. That is the same as —?— dollar.

3. Their mother divided the pie so that each of the 4 children got an equal share. Each got —?— of the pie.

4. John lived three blocks from school. After he had walked one block Mr. Jones gave him a ride in his car the rest of the way. John walked —?— of the way.

5. Mary bought a pint of ice cream. She bought —?— quart.

6. Sue bought six eggs. This is —?— dozen.

Do It Quickly

Write only the answers to these examples:

	a	b	c	d
1.	8×0	$54 \div 9$	9×2	8×8
2.	$8 \div 8$	8×1	$9 \div 9$	9×7
3.	$18 \div 9$	9×6	$16 \div 8$	8×5
4.	9×3	$63 \div 9$	8×9	$24 \div 8$
5.	8×3	9×0	$45 \div 9$	8×7
6.	$81 \div 9$	$40 \div 8$	$0 \div 8$	9×8
7.	$48 \div 8$	9×1	8×2	$36 \div 9$
8.	9×4	$27 \div 9$	$32 \div 8$	9×5
9.	9×9	8×6	$72 \div 9$	$64 \div 8$
10.	$72 \div 8$	$56 \div 8$	8×4	$0 \div 9$

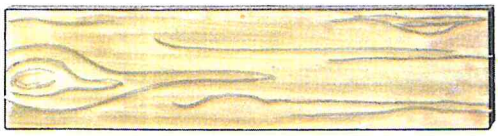
MAKING GAME BOARDS

(Equivalent fractions)

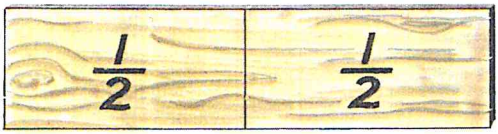
The boys in the wood shop were making game boards. They needed 4 pieces of plywood 1 foot square. They had a piece of plywood that was 1 foot wide and 4 feet long.

First, they sawed the plywood into two equal pieces as shown in the second picture below. Then they sawed each $\frac{1}{2}$ into two equal pieces.

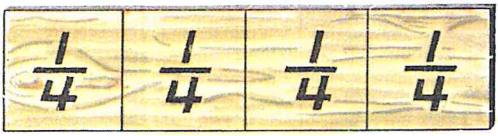
The whole board



The board cut into two equal pieces



The board cut into four equal pieces



Each of the small pieces of the board is $\frac{1}{4}$ of the whole board. Two of these fourths, or $\frac{2}{4}$, equal $\frac{1}{2}$ of the whole board.

$$\frac{2}{4} = \frac{1}{2}$$

1. If the boys had cut each of the fourths into 2 equal pieces, how many pieces would they have had?
2. What fraction would tell us how much of the whole board each of these pieces was? Draw a picture to show this.
3. How many eighths does it take to make $\frac{1}{4}$?
4. How many eighths does it take to make $\frac{1}{2}$?
5. How many eighths does it take to make $\frac{3}{4}$?
6. Which is more, $\frac{1}{2}$ or $\frac{1}{4}$?
7. Which is less, $\frac{2}{3}$ or $\frac{1}{3}$?
8. Which is more, $\frac{3}{4}$ or $\frac{1}{2}$?
9. Which is less, $\frac{2}{3}$ or $\frac{1}{2}$?

Time for Practice

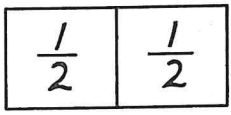
Copy these examples and multiply:

	a	b	c	d
1. Multiply by 2:	346	510	278	975
2. Multiply by 6:	275	218	943	710
3. Multiply by 8:	253	923	407	618
4. Multiply by 3:	108	576	901	432
5. Multiply by 9:	369	677	502	534
6. Multiply by 7:	820	611	207	843

Copy these examples and divide:

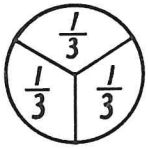
	a	b	c	d
7. Divide by 3:	63	65	171	243
8. Divide by 5:	55	75	195	470
9. Divide by 9:	87	64	189	270
10. Divide by 7:	84	40	217	427
11. Divide by 8:	96	34	168	240
12. Divide by 6:	60	84	402	372

FRACTIONAL PARTS IN A WHOLE



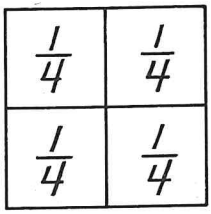
This rectangle is divided into two equal parts. Each part is $\frac{1}{2}$. There are two halves in a whole. We can write the fact this way:

$$\frac{2}{2} = 1$$



This circle is divided into three equal parts. Each part is $\frac{1}{3}$. There are three thirds in a whole. We can write the fact this way:

$$\frac{3}{3} = 1$$



This square is divided into four equal parts. Each part is $\frac{1}{4}$. There are four fourths in a whole. We can write the fact this way:

$$\frac{4}{4} = 1$$

We learned that the part of the fraction below the line tells us into how many equal parts the whole is divided. The part of the fraction above the line tells us how many of these parts are used in the fraction. When these two numbers are the same they show the whole thing.

Whole means all of something. If we have a **whole** apple, we have **one** apple. If we have a **whole** pie, we have **one** pie.

If we divide the apple into two equal parts, each part is $\frac{1}{2}$. The whole apple is $\frac{2}{2}$, or 1, apple.

If we divide the pie into 6 equal pieces, each part is $\frac{1}{6}$. The whole pie is $\frac{6}{6}$, or 1, pie.

1. If a stick of chalk is divided into three equal pieces, what fraction shows one piece? What fraction shows the whole stick of chalk?

2. If a cake is cut into eight equal pieces, what fraction shows one piece? What fraction shows the whole cake?

Time for Practice

Copy these examples and write the sums:

	a	b	c	d	e
1.	744 985	311 493	295 137	749 987	887 989
2.	568 793	871 637	263 676	741 260	255 872

Copy these examples and write the differences:

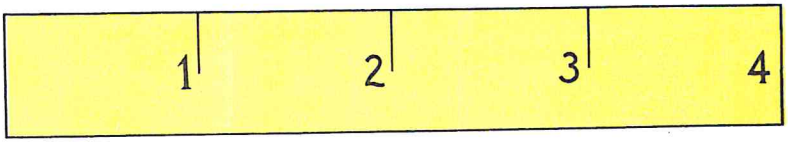
	a	b	c	d	e
3.	384 177	42 18	731 619	647 154	308 247
4.	619 348	4762 487	3846 919	504 78	6380 1707

Practice with Fractional Parts

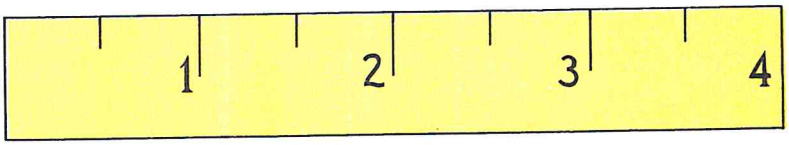
1. Tell what fractional part a quarter means.
2. Read these aloud: $\frac{1}{8}$, $1\frac{1}{2}$, $2\frac{1}{4}$, $5\frac{1}{3}$
3. Which of these fractions means the same as 1? $\frac{3}{4}$, $\frac{2}{2}$, $\frac{2}{3}$
4. If you cut a board into fourths, how many pieces would you have?
5. Draw a circle and color $\frac{1}{2}$ of it red.
6. Draw a square and color $\frac{1}{4}$ of it blue.
7. Draw a rectangle. Color $\frac{1}{3}$ of it green, $\frac{1}{3}$ blue, and $\frac{1}{3}$ brown.
8. Draw a triangle and color $\frac{1}{2}$ of it orange.
9. Draw a circle. Color $\frac{1}{4}$ of it red and $\frac{3}{4}$ yellow.
10. Draw a square. Color $\frac{1}{3}$ of it blue and $\frac{2}{3}$ green.

FRACTIONS OF AN INCH

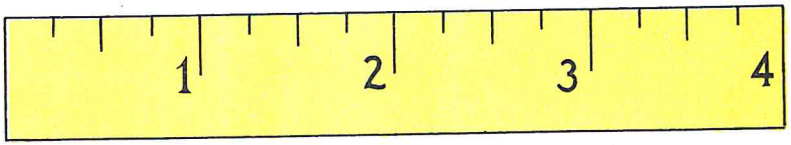
The inches on some rulers are divided into fractional parts. Study these pictures of parts of rulers.



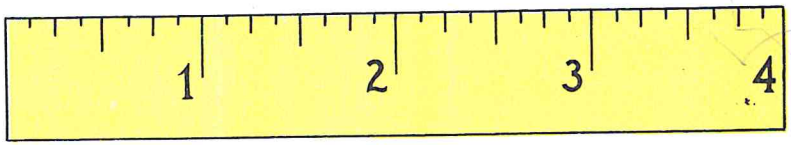
The ruler above is 4 inches long. The inches are not marked into fractional parts. We could not measure fractions of an inch with a ruler like this.



1. The ruler above is divided into $\frac{1}{2}$ inches (one-half inches). How many half inches are there in a whole inch?



2. The ruler above is divided into $\frac{1}{4}$ inches (one-fourth inches). How many $\frac{1}{4}$ inches are there in a whole inch?



3. The inches of this ruler are divided into $\frac{1}{8}$ inches (one-eighth inches). How many $\frac{1}{8}$ inches are there in a whole inch?

4. Study your ruler and tell whether the inches are divided into half inches, fourths, or eighths.

5. How many inches are there in a foot? What fractional part of a foot ruler are the 4 inches of each ruler shown on page 236?

6. Measure your arithmetic book and tell how long it is.

7. Measure two other schoolbooks and write their lengths.

8. How many fourths are there in a half inch? How many eighths are there in $\frac{1}{4}$ inch? in $\frac{1}{2}$ inch?

9. Show on your ruler that $\frac{6}{8} = \frac{3}{4}$.

10. Show on your ruler that $\frac{4}{2} = 2$, that $\frac{3}{2} = 1\frac{1}{2}$, that $\frac{6}{4} = 1\frac{1}{2}$, that $\frac{8}{4} = 2$.

MORE ROMAN NUMBERS

1. What letters did the Romans use for each of these numbers? 1, 10, 5

2. Tell the Roman numbers for these Arabic numbers:

7 13 24 3 8 29

3. The Romans wrote the numbers for 31 to 39 in much the same way that they wrote the numbers for 21 to 29. For 32 they wrote XXXII. How do you think they wrote 38?

4. The Romans used L for 50. Then they wrote 40 this way: XL. The number XL shows that 10 is subtracted from 50. What does XLIII mean?

5. Tell what these Roman numbers mean: XLI, XLIX, XXXVI, XLV, XXXIX, XLVII, XXXI, XLIV

6. Write the Roman numbers from 30 to 50.

Time for Practice

Copy these examples and multiply:

	a	b	c	d
1. Multiply by 4:	369	504	819	706
2. Multiply by 6:	538	790	621	572
3. Multiply by 7:	476	281	509	674
4. Multiply by 9:	287	605	419	367

Copy these examples and divide:

	a	b	c	d
5. Divide by 2:	162	136	108	188
6. Divide by 5:	265	115	345	475
7. Divide by 3:	138	156	297	102
8. Divide by 8:	648	576	464	256

Time for Practice

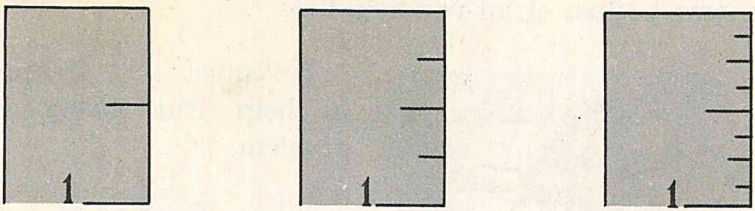
Copy these examples and find the answers:

	a	b	c	d	e
1.	$\begin{array}{r}756\\ \times 4\\ \hline\end{array}$	$8\overline{)656}$	$\begin{array}{r}986\\ +124\\ \hline\end{array}$	$\begin{array}{r}673\\ \times 8\\ \hline\end{array}$	$\begin{array}{r}872\\ -196\\ \hline\end{array}$
2.	$6\overline{)78}$	406–251	$\begin{array}{r}842\\ \times 9\\ \hline\end{array}$	$7\overline{)448}$	$\begin{array}{r}268\\ +74\\ \hline\end{array}$
3.	$\begin{array}{r}509\\ \times 7\\ \hline\end{array}$	$\begin{array}{r}968\\ -685\\ \hline\end{array}$	$9\overline{)198}$	$\begin{array}{r}569\\ +724\\ \hline\end{array}$	74 + 53
4.	739–54	$\begin{array}{r}107\\ \times 6\\ \hline\end{array}$	$4\overline{)72}$	$9\overline{)423}$	$\begin{array}{r}665\\ +809\\ \hline\end{array}$
5.	$5\overline{)290}$	$\begin{array}{r}767\\ -398\\ \hline\end{array}$	$\begin{array}{r}735\\ +945\\ \hline\end{array}$	$\begin{array}{r}356\\ -157\\ \hline\end{array}$	$\begin{array}{r}509\\ +79\\ \hline\end{array}$

HOW MUCH IS AN EIGHTH?

Harry asked, "Is $\frac{3}{8}$ inch more or less than $\frac{1}{2}$ inch?"

The pupils looked at their rulers to find the answer to Harry's question.



Look at the picture. The first inch is marked in halves, the second in fourths, and the third in eighths.

1. Is $\frac{3}{8}$ inch more or less than $\frac{1}{2}$ inch?
2. Is $\frac{5}{8}$ inch more or less than $\frac{1}{2}$ inch?
3. How many fourths of an inch make one-half inch?
4. How many eighths of an inch make one-half inch?
5. How many fourths make one inch?
6. How many eighths make one inch?
7. Is $\frac{6}{8}$ inch more than, less than, or the same as $\frac{3}{4}$ inch?
8. Measure four things on your desk or in your room. Write the measurements.

Time for Practice

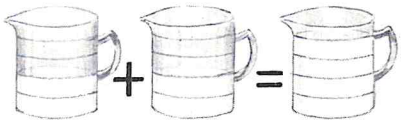
Copy these examples and write the sums:

a	b	c	d	e	f
75	85	96	48	88	49
89	88	68	86	68	67
78	69	59	77	98	87
58	79	98	99	68	79

ADDING FRACTIONS

Ruth is learning to cook. A recipe says, "Pour $\frac{1}{2}$ cup of milk and stir; then add another $\frac{1}{2}$ cup of milk." Ruth asked her mother how much milk she needed in order to have two $\frac{1}{2}$ cups. Can you help her?

We must add fractions to help Ruth work her problem.



$\frac{1}{2}$ cup + $\frac{1}{2}$ cup = $\frac{2}{2}$, or 1, cup

When we add fractions, the fractions must have the same number below the line. The fractions must have the same name. We write the number that is the fractions' name and add the numbers that are above the lines.

When we add $\frac{1}{2}$ and $\frac{1}{2}$ we first write $\frac{\ }{2}$. Then we add $1 + 1$ and write the sum, or 2, for the upper number. $\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$. We know that two halves make a whole, or one. $\frac{2}{2} = 1$

How can we add $\frac{1}{3}$ and $\frac{1}{3}$? Do these fractions have the the same name? Study these examples:

1 apple + 1 apple = 2 apples

1 third + 1 third = 2 thirds

or

$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

1. Copy these examples and add:

a. $\frac{1}{4} + \frac{1}{4}$ **b.** $\frac{1}{6} + \frac{1}{6}$ **c.** $\frac{1}{8} + \frac{1}{8}$ **d.** $\frac{1}{5} + \frac{1}{5}$ **e.** $\frac{1}{7} + \frac{1}{7}$

How do we add $\frac{1}{3}$ and $\frac{2}{3}$? You see that the fractions have the same lower number, or name. Write 3 as the lower number of the sum. Then add the 1 and 2. Write 3 as the upper number of the sum.

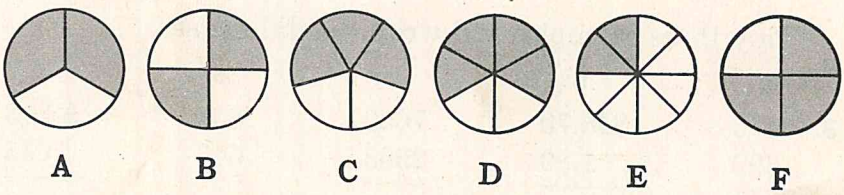
1 third + 2 thirds = 3 thirds or a whole

$$\frac{1}{3} + \frac{2}{3} = \frac{3}{3} \text{ or } 1$$

2. Copy these examples and add:

a. $\frac{1}{4} + \frac{2}{4}$ **b.** $\frac{2}{6} + \frac{3}{6}$ **c.** $\frac{1}{8} + \frac{3}{8}$ **d.** $\frac{1}{5} + \frac{2}{5}$ **e.** $\frac{1}{4} + \frac{3}{4}$

Practice with Fractional Parts



A **B** **C** **D** **E** **F**

1. Circle **A** is divided into 3 equal parts. Two parts are shaded. We can say that $\frac{2}{3}$ of the circle are shaded. What fractional part is not shaded?

2. Circle **B** is divided into 4 equal parts. Two parts are shaded. We can say that $\frac{2}{4}$ of the circle are shaded. Can we say that $\frac{1}{2}$ of Circle **B** is shaded?

3. How much of Circle **C** is shaded?

4. How much of Circle **C** is not shaded?

5. Circle **D** is divided into 6 equal parts. Four parts are shaded. We can say that $\frac{4}{6}$ are shaded. Is the same amount of Circle **A** and Circle **D** shaded? Can we say that $\frac{4}{6} = \frac{2}{3}$?

6. How much of Circle **D** is not shaded? Say this two ways.

7. How much of Circle **E** is shaded? Say this two ways.

8. How much of Circle **F** is shaded? Can we say this two ways?

Time for Practice

Copy these examples and write the sums:

	a	b	c	d	e
1.	500	$6.18	942	401	$9.50
	208	5.29	802	131	5.11
	161	8.18	174	581	5.17
2.	234	427	$1.27	821	$4.15
	403	417	2.29	421	3.67
	748	477	8.25	221	5.61

Copy these examples and write the differences:

	a	b	c	d	e
3.	8475	$48.70	7650	852	$8.43
	692	1.80	2963	646	5.45
4.	1210	$10.28	1375	8019	$38.34
	556	9.44	857	7566	8.34

Choosing the Right Answer

Choose the one answer of the four answers given that you think is best. Tell why you chose it.

1. Jane's mother is going to make a dress for Jane. Jane is ten years old. How much cloth will be needed? (**a**) 24 inches (**b**) 1 foot (**c**) $2\frac{1}{2}$ yards (**d**) 10 yards

2. Father takes his lunch to work. Mother makes some coffee for him to take. How much would she make? (**a**) 1 pint (**b**) 1 gallon (**c**) 2 quarts (**d**) $\frac{1}{2}$ gallon

3. Thirty children in Miss Hill's room are going to a picnic. How much lemonade will they drink? (**a**) 2 quarts (**b**) 15 pints (**c**) 10 gallons (**d**) 20 gallons

SUBTRACTING FRACTIONS

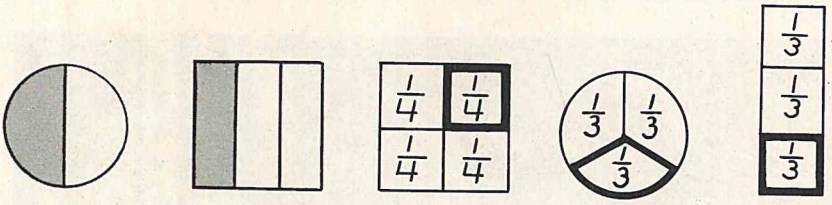
David's mother was packing a picnic basket. She asked David to go to the refrigerator and get $\frac{3}{4}$ pound of butter. David brought $\frac{1}{4}$ pound. How much more did David need to get to have $\frac{3}{4}$ pound?

To work this problem, we must subtract a fraction. We must subtract $\frac{1}{4}$ from $\frac{3}{4}$. Study the picture of 3 fourth-pounds of butter.

To subtract, we must take $\frac{1}{4}$ from $\frac{3}{4}$. We then have $\frac{2}{4}$ pound left.

$$\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$$

We know that $\frac{2}{4}$ is the same as $\frac{1}{2}$. So $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$ or $\frac{1}{2}$. David still needs to get $\frac{1}{2}$ pound of butter.



A **B** **C** **D** **E**

1. How much of Circle **A** will be left if the shaded part is taken away? Can this be written $1 - \frac{1}{2} = \frac{1}{2}$?

2. How much of Rectangle **B** is left if the shaded part is taken away? Can this be written $\frac{3}{3} - \frac{1}{3} = \frac{2}{3}$?

3. Tell how much will be left if we take away the part with the heavier outline from each of Figures **C, D,** and **E.** Write these statements as subtraction examples.

Copy these examples and subtract:

	a	b	c	d
4.	$\frac{3}{4} - \frac{1}{4}$	$\frac{2}{4} - \frac{1}{4}$	$1 - \frac{1}{2}$	$\frac{2}{3} - \frac{1}{3}$
5.	$1 - \frac{1}{3}$	$1 - \frac{1}{4}$	$\frac{1}{2} - \frac{1}{4}$	$\frac{2}{5} - \frac{1}{5}$

MEASURING WITH THE YARDSTICK

The pupils in Longfellow School made a chart to show how tall each pupil was. They divided into pairs. Each pupil in a pair measured the other pupil. They marked each other's height on the blackboard with chalk and then measured the distance from the floor with a yardstick. To measure correctly, they had to know that:

12 inches = 1 foot

3 feet = 1 yard

A part of the chart they made is shown below.

Name	Height
Sue Adams	4 ft. 8 in.
Tom Berry	4 ft. 6 in.
Charles Dolan	4 ft. 3 in.

1. Measure the length and width of your room.

2. Measure the length and width of the top of your desk.

3. Measure the length and width of the top of the teacher's desk.

4. Measure the height of the teacher's desk.

5. Measure the width of the schoolroom door.

6. Divide into pairs and measure the height of your partner.

★**7.** Make a chart for all the pupils in your room as the Longfellow pupils did.

Time for Practice

Copy these examples and write the sums. Add down. Check by adding up.

	a	b	c	d	e	f
1.	711	535	413	165	746	604
	147	253	380	428	112	793
	141	717	261	473	729	891
2.	789	865	745	999	424	285
	200	404	881	444	710	572
	509	430	951	333	744	961

Copy these examples and write the differences:

	a	b	c	d	e
3.	5776	7320	1258	3169	128
	68	988	352	972	33
4.	1203	8515	5091	658	962
	239	1006	2247	342	868
5.	$86.47	$72.18	$99.34	$65.01	$2.53
	9.04	48.73	15.68	2.73	1.09

Copy these examples and find the answers:

	a	b	c	d	e
6.	418	8)96	538	403 + 7	684
	×8		×9		−85
7.	8)744	909	607	259	470
		−100	+993	×8	+721

ADDING AND SUBTRACTING FRACTIONS

Answer these questions without using paper or pencil:

1. How much is $\frac{1}{2}$ glass of water and $\frac{1}{2}$ glass of water? Say the answer two ways.

2. John had $\frac{1}{3}$ of his stamp album filled. He worked a week and filled another third. How much was then filled?

3. How much is $\frac{3}{8}$ inch plus $\frac{1}{8}$ inch?

Copy these examples and write the sums:

	a	b	c
4.	$\frac{1}{3} + \frac{1}{3}$	$\frac{1}{2} + \frac{1}{4}$	$\frac{1}{4} + \frac{3}{4}$
5.	$\frac{1}{2} + \frac{1}{2}$	$\frac{1}{5} + \frac{2}{5}$	$1 + \frac{1}{2}$
6.	$\frac{1}{4} + \frac{1}{4}$	$\frac{1}{3} + \frac{2}{3}$	$1 + \frac{1}{4}$

Answer these questions without using paper or pencil:

7. James had an apple. He gave his sister half. How much of his apple was left? Hint: How many halves are there in a whole apple? How many are left if one of the halves is taken away?

8. Edward had a full glass of milk. He drank $\frac{1}{3}$. How much was left? Hint: How many thirds are there in a full glass? How many are left if one third is taken away?

9. Peggy's mother had $\frac{1}{2}$ pie. She gave Peggy $\frac{1}{4}$ of the pie for lunch. How much of the pie remained? Hint: How many fourths are there in one half?

In the examples above you subtracted fractions.

Copy these examples and write the differences:

	a	b	c
10.	$\frac{3}{4} - \frac{1}{4}$	$1 - \frac{1}{2}$	$1 - \frac{3}{4}$
11.	$\frac{1}{2} - \frac{1}{4}$	$1 - \frac{1}{4}$	$1 - \frac{2}{3}$
12.	$\frac{2}{3} - \frac{1}{3}$	$1 - \frac{1}{3}$	$1 - \frac{1}{5}$

Time for Practice

Copy these examples and find the products:

	a	b	c	d
1. Multiply by 5:	324	187	990	458
2. Multiply by 3:	138	642	806	914
3. Multiply by 8:	678	952	368	897
4. Multiply by 2:	653	921	709	864

Copy these examples and divide:

	a	b	c	d
5. Divide by 4:	368	104	232	172
6. Divide by 7:	364	427	665	154
7. Divide by 9:	603	216	810	396
8. Divide by 6:	126	336	144	558

Time for Practice

Copy these examples and find the answers:

	a	b	c	d	e
1.	$\begin{array}{r} 927 \\ -490 \\ \hline \end{array}$	$8\overline{)168}$	$\begin{array}{r} 580 \\ +465 \\ \hline \end{array}$	$7\overline{)64}$	$\begin{array}{r} 659 \\ \times 9 \\ \hline \end{array}$
2.	$\begin{array}{r} 572 \\ \times 5 \\ \hline \end{array}$	$6\overline{)384}$	$\begin{array}{r} 621 \\ \times 8 \\ \hline \end{array}$	$9\overline{)558}$	$\begin{array}{r} 509 \\ -199 \\ \hline \end{array}$
3.	833 − 94	908 + 41	$\begin{array}{r} 979 \\ +662 \\ \hline \end{array}$	$\begin{array}{r} 756 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 857 \\ +67 \\ \hline \end{array}$
4.	$5\overline{)445}$	$\begin{array}{r} 469 \\ +568 \\ \hline \end{array}$	$\begin{array}{r} 434 \\ +258 \\ \hline \end{array}$	$\begin{array}{r} 730 \\ \times 9 \\ \hline \end{array}$	$4\overline{)356}$
5.	$\begin{array}{r} 199 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 864 \\ \times 6 \\ \hline \end{array}$	$9\overline{)66}$	$\begin{array}{r} 487 \\ -69 \\ \hline \end{array}$	649 − 47

SHOPPING AT THE DRUGSTORE

The pupils in Miss Tate's room at Fairview School asked to refill the first-aid cabinet. They asked the school nurse to help them plan what to buy. They had two committees.

One committee went to the White Drugstore to get prices. Julia was chairman. Phil was secretary and wrote the prices of the supplies they needed.

4-ounce bottle antiseptic	36 cents
10 yards 1-inch bandage	49 cents
10 yards 2-inch bandage	59 cents
1 pound sterile cotton	38 cents
4 3-yard rolls $\frac{1}{2}$-inch adhesive tape	23 cents each
4 3-yard rolls 1-inch adhesive tape	29 cents each
2 packages ready bandages	19 cents each

The other committee went to the Corner Drugstore to get the prices there. Harry was chairman of this committee. Kate was secretary and wrote the prices.

5-ounce bottle antiseptic	45 cents
10 yards 1-inch bandage	53 cents
10 yards 2-inch bandage	62 cents
1 pound sterile cotton	35 cents
4 3-yard rolls $\frac{3}{8}$-inch adhesive tape	22 cents each
4 3-yard rolls $1\frac{1}{8}$-inch adhesive tape	33 cents each
2 packages ready bandages	19 cents each

The class then worked together to decide what to buy. They had to answer these questions. Find the answers.

1. How much would it cost if Julia's committee bought everything the class needed at the White Drugstore?

2. How much would it cost if Harry's committee bought everything the class needed at the Corner Drugstore?

3. Would it be cheaper to buy the 4-ounce or the 5-ounce bottle of antiseptic?

4. How much could be saved if the cheaper items were bought at each store?

5. Make up the order as you think it should be bought. Show how much it would cost.

Without Paper and Pencil

Say the answers:

	a	b	c
1.	Five 7's + 3	Eight 6's + 2	Nine 7's + 3
2.	Nine 6's + 7	Seven 8's + 4	Seven 7's + 5
3.	Eight 5's + 5	Nine 4's + 8	Eight 3's + 6
4.	Six 7's + 4	Three 0's + 1	Eight 0's + 4
5.	Eight 9's + 1	Eight 8's + 6	Five 5's + 4

Tell the multiplication and division families for the following numbers:

	a	b	c
6.	4, 7, 28	72, 8, 9	5, 9, 45
7.	3, 27, 9	42, 6, 7	3, 6, 18
8.	5, 8, 40	6, 9, 54	24, 6, 4
9.	36, 9, 4	4, 8, 32	9, 63, 7

MEASURING LIQUIDS IN SMALL AMOUNTS

When the pupils in Miss Tate's room at Fairview School refilled the first-aid cabinet they learned some new terms.

John said that he had heard about an ounce of liquid but that he did not know just how much it was. He learned these facts:

32 ounces = 1 quart
16 ounces = 1 pint

1. How many ounces are there in two quarts?
2. How many ounces are there in three pints?
3. How many ounces does a half-pint cream bottle hold?
4. If a medicine bottle holds 2 ounces, how many of these bottles of medicine would it take to make a pint?
5. Bring from home an empty medicine bottle that is marked in ounces.

6. Many bottles are not marked to show how much they hold, but they do have **labels.** What is a **label?** Look at the label on an ink bottle. What does it tell you?

7. Look at the two pictures on this page. They say **fluid ounces.** Find the difference between fluid ounces and ounces of weight.

8. Tell why these people have to know about fluid ounces: doctor, druggist, nurse. How will it help you to know about fluid ounces?

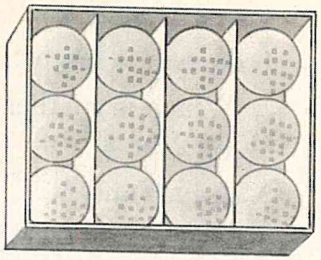
PARTS OF A GROUP AS FRACTIONS

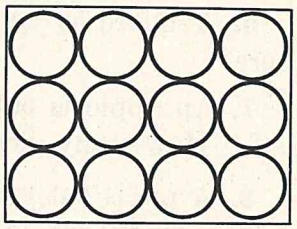
Tom's father bought 12 golf balls. They were packed in a box divided into fourths. There were 3 balls in each fourth of the box.

We say that 3 is $\frac{1}{4}$ of 12.

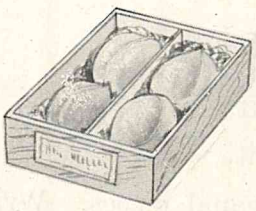
Fractions show parts of a whole thing. They also show parts of a group.

The top picture at the right shows the box of golf balls divided into fourths. The rectangle is also divided into parts. Each part is $\frac{1}{4}$. There are 12 circles. Each group of 3 circles is $\frac{1}{4}$ of 12 circles.

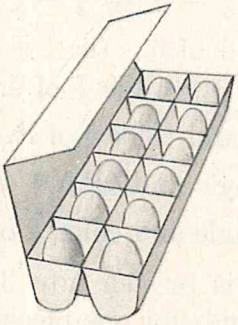




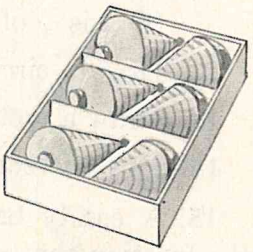
Study the pictures below:



2 is $\frac{1}{2}$ of 4.



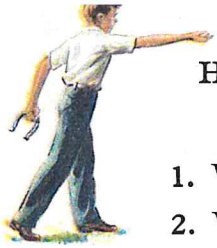
6 is $\frac{1}{2}$ of 12.



2 is $\frac{1}{3}$ of 6.

Write only the answers:

	a	b	c
1.	3 is $\frac{?}{?}$ of 6.	3 is $\frac{?}{?}$ of 9.	4 is $\frac{?}{?}$ of 8.
2.	1 is $\frac{?}{?}$ of 3.	5 is $\frac{?}{?}$ of 10.	1 is $\frac{?}{?}$ of 4.



HOW MUCH HAVE YOU LEARNED?

(Chapter Test 8)

1. Which is larger: (a) $\frac{1}{2}$ or $\frac{1}{4}$? (b) $\frac{2}{3}$ or $\frac{1}{3}$?

2. Which is smaller: (a) $\frac{1}{2}$ or $\frac{1}{3}$? (b) $\frac{3}{4}$ or $\frac{1}{2}$? (c) $\frac{5}{8}$ or $\frac{1}{2}$?

3. Add $\frac{2}{3}$ and $\frac{1}{3}$.

4. Subtract $\frac{1}{4}$ from $\frac{3}{4}$.

5. A board is cut in half. How many pieces are there?

6. A board is cut in fourths. How many pieces are there?

7. An apple is cut in half. Then each piece is cut in half. How many pieces of apple are there?

8. A pie is cut into 6 equal pieces. Write the fraction that shows the whole pie.

9. Add: (a) $\frac{1}{6} + \frac{1}{6}$ (b) $\frac{3}{4} + \frac{1}{4}$ (c) $\frac{3}{8} + \frac{1}{8}$ (d) $\frac{3}{5} - \frac{2}{5}$

10. Subtract: (a) $\frac{5}{6} - \frac{1}{6}$ (b) $\frac{3}{8} - \frac{1}{8}$ (c) $1 - \frac{1}{2}$ (d) $\frac{3}{5} - \frac{2}{5}$

11. Find: (a) 3 is $\frac{?}{?}$ of 6. (b) 1 is $\frac{?}{?}$ of 3. (c) 2 is $\frac{?}{?}$ of 8. (d) 3 is $\frac{?}{?}$ of 9.

12. Draw a circle and color $\frac{3}{6}$ of it.

13. Draw a rectangle and color $\frac{1}{4}$ of it.

14. Draw a rectangle and color $\frac{3}{8}$ of it.

15. A candy bar is broken into 3 equal pieces. Write the fraction that stands for one piece.

16. A glass is half full of water. Write the fraction that tells how full the glass is.

17. A glass that is $\frac{3}{4}$ full of water is emptied until it is $\frac{1}{2}$ full. How much water was poured out?

18. Mary has cracked $\frac{1}{3}$ cup of nuts, but she needs $\frac{2}{3}$ cup. What part of a cup of nuts does Mary still need?

IMPROVE YOUR SKILLS

(Diagnostic Test 7)

Work each set of examples. If you miss more than one example in any set, you need to review.

1. 506×4 308×7 409×6 **(139)**

2. $\frac{1}{2}$ of 12 **(144)**
$\frac{1}{4}$ of 24
$\frac{1}{3}$ of 45

3. $4\overline{)92}$ $6\overline{)78}$ $7\overline{)84}$ **(148)**

4. $6\overline{)780}$ $5\overline{)800}$ $7\overline{)910}$ **(154)**

5. Add: **(181)**

531	340	697
422	135	880
687	962	715
235	144	690

6. Add: **(206)**

15	23	7004
419	5	367
6	4116	8
7802	243	46

7. $5469 - 3629$ $3547 - 1788$ $7415 - 2738$ **(190)**

HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 8)

Work these problems. Show all your work on your paper.

1. John bought a pound of lawn seed. He used $\frac{1}{4}$ of it. How much of the seed was left?

2. Mary made two kinds of cookies. She used $\frac{1}{4}$ of a chocolate bar in one kind and $\frac{3}{4}$ of the bar in the other kind. How much chocolate did she use all together?

3. Kim had four large sheets of paper. He cut each sheet in half. How many pieces did he have then?

Turn to page 254.

4. Steve had $\frac{1}{5}$ of a pie one day and another $\frac{1}{5}$ the next day. How much of the whole pie did he eat?

5. Harriet drew a large circle. She colored $\frac{1}{6}$ of it yellow and $\frac{1}{6}$ of it green. How much of the circle was not colored? Write this fraction two ways.

6. Charles had four sandwiches in his picnic lunch. He gave one sandwich to Don. What fractional part of his sandwiches did he give to Don?

7. Karen had 8 sheets of colored paper and gave $\frac{1}{2}$ of them to her sister Betty. How many sheets of paper did she have left?

8. Alice bought 5 ounces of antiseptic for 45 cents. How much did she pay per ounce?

9. Marie's mother bought a dozen eggs. She used $\frac{1}{4}$ of them to bake a cake. How many eggs did she use?

10. Tom's mother bought a dozen oranges. The family ate $\frac{1}{3}$ of them for breakfast. How many oranges were left?

DO YOU LEARN AND REMEMBER?

(Progress Test 7)

1. Write these numbers as Roman numbers:

   10 24 9 36 50

2. Write the multiplication facts for 8 through 9×8.

3. Write the division facts for 9 through $81 \div 9$.

Copy these examples and write the answers:

	a	b	c	d	e
4.	65	\$.80	403	\$1.15	700
	$\times 3$	$\times 7$	$\times 6$	$\times 5$	$\times 9$

	a	b	c
5.	$89 + 14$	$\$1.38 + \$.67$	$7 + 93$
6.	$832 - 17$	$4301 - 658$	$\$80.00 - \$12.50$
7.	$6\overline{)186}$	8×437	$7\overline{)784}$
8.	$9\overline{)90}$	$8\overline{)408}$	$5\overline{)370}$

Things to Do

★ **1.** Make as long a list as you can of words that tell how much but are not numbers. These are examples: some, pair, few. See if you can write twenty-five words.

★ **2.** Try to bring to school pieces of money used in foreign countries. Show them to the other pupils. Countries whose money you may be able to get are Canada, Mexico, France, and England.

★ **3.** If you collect stamps, perhaps you can bring some of your stamps to class. The other pupils will like to see them. From what different countries do your stamps come? How is the value of each stamp shown?

QUESTIONS ABOUT TIME

(*Enrichment material*)

Write the answers to the following questions:

1. If each pupil in your room wasted five minutes each day, how much time would the entire class waste in one day?

2. If the school day were 12 minutes longer, how many minutes more would you go to school each week?

3. How many more hours each week would you go to school if the school day were 12 minutes longer?

CHAPTER IX

Harder Multiplication and Division

SHOPPING WITH MOTHER

Billy and Fern Clark often went to the market with their mother. Together they would buy a week's supply of groceries and vegetables.

1. One kind of apple was 3 pounds for 27¢. Another kind was marked 8¢ per pound. Mrs. Clark bought 3 pounds of the cheaper apples. Which apples were cheaper? How much did Mrs. Clark pay? How much did she save by buying the cheaper apples?

2. One kind of grapefruit was 6 for 34 cents. Another kind was 3 for 23 cents. Mrs. Clark bought a dozen at 3 for 23 cents. How much did she pay? How much would a dozen of the other grapefruit cost? How much more did Mrs. Clark pay for the kind she bought?

3. Billy bought the canned goods. He bought 3 cans of soup at 11 cents each, 2 cans of fruit at 37 cents each, 4 cans of corn at 19 cents each, 3 cans of peas at 21 cents each, and 8 cans of baby food at 9 cents each. How much did each kind of canned goods cost? How much did all of the canned goods cost together?

4. Mrs. Clark bought 3 pounds of meat at 69 cents per pound, and 2 pounds of cheese at 51 cents per pound. She also bought 6 boxes of soap chips at 17 cents a box, and 1 pound of little cakes at 38 cents. How much did each kind of thing cost? How much did all of them cost together?

5. Then Mrs. Clark bought 15 pounds of potatoes at 5 cents per pound. How much did the potatoes cost?

6. There was a sale on paper nakins — 10 boxes for 70¢. Fern bought 10 boxes. How much was this for one box?

7. What was the cost of all the things that were bought by Fern and Billy and Mrs. Clark?

MULTIPLICATION TEST

	a	b	c	d	e	f	g	h	i	j
1.	1	1	4	1	2	3	0	2	0	4
	×1	×2	×2	×6	×1	×1	×3	×4	×5	×0
2.	1	1	2	0	3	2	0	0	1	4
	×3	×7	×6	×6	×2	×5	×1	×2	×8	×1
3.	0	2	2	1	7	2	5	9	0	5
	×7	×3	×7	×5	×0	×2	×0	×2	×8	×1
4.	6	6	5	0	9	9	1	6	8	3
	×2	×0	×2	×9	×1	×0	×4	×1	×0	×0
5.	1	2	7	8	2	1	7	2	0	8
	×9	×8	×1	×1	×9	×0	×2	×0	×4	×2

MULTIPLICATION TEST

	a	b	c	d	e	f	g	h	i	j
1.	3	3	3	7	8	3	8	9	6	6
	×4	×9	×3	×9	×9	×5	×3	×7	×5	×4
2.	7	8	4	4	5	7	4	3	6	7
	×7	×6	×4	×3	×7	×6	×9	×8	×3	×8
3.	5	9	6	4	5	4	5	3	5	6
	×3	×8	×7	×6	×5	×8	×4	×7	×9	×6
4.	8	9	3	9	4	8	7	6	5	7
	×7	×5	×6	×4	×7	×5	×3	×9	×8	×4
5.	5	9	9	8	7	6	8	4	9	0
	×6	×9	×3	×8	×5	×8	×4	×5	×6	×0

MULTIPLICATION OF FOUR-PLACE NUMBERS

It is easy to multiply four-place numbers if you can multiply three-place numbers. Practice multiplying these three-place numbers:

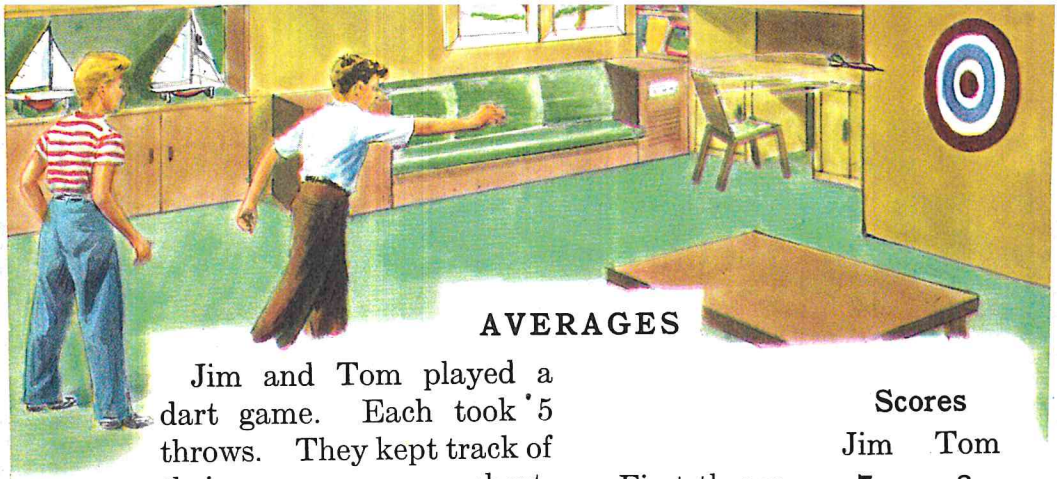
	a	b	c	d	e	f
1.	427	384	541	614	392	879
	×6	×7	×9	×8	×7	×5
2.	540	762	473	538	753	908
	×8	×9	×7	×6	×8	×9

Study the example at the right. Do you find multiplying a four-place number very different from multiplying a three-place number?

6307
×8
50,456

Copy these examples and write the products:

	a	b	c	d	e
3.	1604	3829	3791	3047	3958
	×5	×4	×6	×7	×5
4.	6754	6248	5864	2089	9168
	×4	×7	×6	×6	×7
5.	4265	7838	8726	8409	3834
	×7	×6	×8	×9	×8
6.	1950	7803	9183	5271	5676
	×8	×7	×9	×9	×9



AVERAGES

Jim and Tom played a dart game. Each took 5 throws. They kept track of their scores on a chart. They added their 5 scores to find their total scores.

After they had found their total scores Jim said, "If I had made 6 on each throw, I would have had the same total score."

Was Jim's statement true?

	Scores	
	Jim	Tom
First throw	7	8
Second throw	6	7
Third throw	7	6
Fourth throw	2	9
Fifth throw	8	5
Total	30	35
Average	6	7
	5)30	5)35

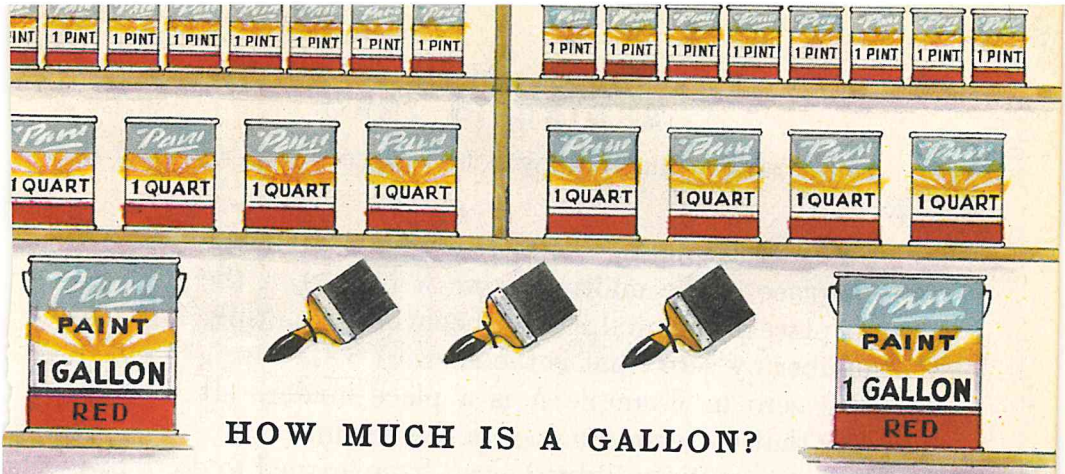
What score could Tom have made on each throw to have a total score of 35?

This score is called an **average.** The average score is found by dividing the total score by the number of scores. Jim's average was 30 ÷ 5, or 6. Tom's was 35 ÷ 5, or 7.

We find an average by adding two or more numbers and then dividing their sum by the number of numbers.

Find the averages of these numbers:

	a	b
1.	4, 8, 5, 7	8, 10, 12
2.	9, 3, 6, 2, 5	5, 8, 11, 8
3.	1, 3, 7, 9, 4, 6	9, 13, 15, 11, 12



HOW MUCH IS A GALLON?

(Review)

How much is a gallon? A gallon, you know, is four quarts. A gallon is also eight pints. Be sure that you remember these facts:

2 pints = 1 quart
4 quarts = 1 gallon
8 pints = 1 gallon

1. Name as many things as you can that are measured by the gallon.

2. On a western farm there is a large tank that holds almost 50,000 gallons. How many quarts are 50,000 gallons? How many pints are 50,000 gallons?

3. Find out how many gallons of gasoline a gasoline truck can carry.

4. If your furnace burns oil, find out how many gallons of oil your furnace tank will hold.

5. If your family has an automobile, find out how much gasoline the tank will hold.

6. If you live on a farm and have a water tank, find out, if you can, how many gallons of water it will hold.

TWO-PLACE MULTIPLIERS ENDING IN ZERO

It is easy to multiply by a two-place number ending in zero.

Study Example **A.** To multiply by the 0 in the ones' place of the multiplier, we write a 0 in the ones' place of the product. Whenever we multiply a number by zero what is the answer?

A

$$\begin{array}{r} 54 \\ 20 \\ \hline 1080 \end{array}$$

The zero in Example **A** is a place holder. It means that there are no ones in the product.

Now we multiply 54 by 2 as we have learned to do. Two 4's are 8. We write the 8 in the tens' place. Two 5's are 10. We write the 0 in the hundreds' place and the 1 in the thousands' place. The product is 1080.

When we multiply by a number that has zero in the ones' place, we write zero in the ones' place of the product as a place holder.

When we multiply by a two-place number ending in zero and need to carry, we multiply just as before. Study Example **B.**

First we multiply by the 0 in the ones' place. The product is 0. We write the 0 in the ones' place of the product. Next we multiply by 4. Four 6's are 24. We write the 4 in the tens' place and carry the 2. Four 3's are 12. Add the 2 that was carried. The sum is 14. We write the 14 in the hundreds' and thousands' places. The product is 1440.

B

$$\begin{array}{r} 36 \\ 40 \\ \hline 1440 \end{array}$$

What can you tell about the red numbers below?

$$\begin{array}{r} 36 \\ 20 \\ \hline 720 \end{array} \qquad \begin{array}{r} 24 \\ 30 \\ \hline 720 \end{array} \qquad \begin{array}{r} 42 \\ 40 \\ \hline 1680 \end{array} \qquad \begin{array}{r} 23 \\ 20 \\ \hline 460 \end{array}$$

Copy these examples and find the products:

	a	b	c	d	e	f
1.	43	38	76	47	29	84
	×20	×20	×30	×40	×30	×50
2.	47	63	38	47	18	35
	×60	×70	×60	×80	×90	×80
3.	$.29	$.65	$.84	$.89	$.79	$.73
	×90	×90	×80	×70	×80	×90

GOING TO CAMP

(Different processes in problem solving)

The Friendly Boys Club furnished certain things to every boy who went to camp. Each thing and how much it cost the club is shown in the table at the right.

Swimming trunks	$1.10
Flashlight	.78
Toilet articles	.89
Knapsack	1.05
Canteen	.96
Camp hat	.94

1. How much did all the things for one boy cost?

2. Twenty boys went to camp. How much did the canteens for all the boys cost?

3. How much did each of the other things for all the boys cost?

4. How much more did 20 canteens cost than 20 flashlights?

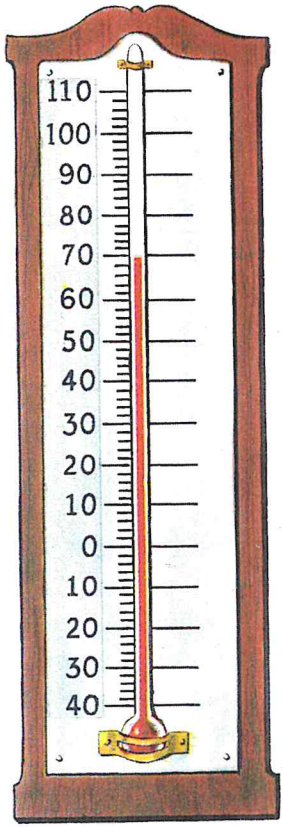
★**5.** Write a problem about the camp hats that uses addition. Work your problem.

★**6.** Write a problem about the knapsacks that uses subtraction. Work your problem.

★**7.** Write a problem about the swimming trunks that uses multiplication. Work your problem.

THERMOMETERS

We use a **thermometer** to see how hot or cold it is. That is, a thermometer is used to measure **temperature.** Is there a thermometer in your schoolroom? If there is, study it. If not, try to bring one for the class to study. Study the picture of the thermometer on this page.



What temperature does the thermometer in your schoolroom show now? When we look at a thermometer to see what temperature it shows we say that we read the thermometer.

The best temperature for the schoolroom or home is from 68 to 72 degrees. **Degree** is the word we use to tell what the temperature is. It is a word like **minute.** Minutes are measures of time. Degrees are measures of temperature.

When the thermometer reads 32 degrees water will freeze. When the thermometer reads 100 degrees it is very warm. When it reads 0 degrees it is very cold. Sometimes it gets colder than 0. Then we say that the temperature is below 0. When it is 30 degrees below 0 it is very, very cold.

The doctor and the nurse use a special kind of thermometer to measure the temperature of the body. When the body temperature is about 98 or 99 degrees we say the temperature is **normal.** If the body temperature goes above 99 we know that the person is not well.

1. Use each of these words in a sentence: thermometer, temperature, degree. Tell in your sentence what the word means.

2. Make as long a list as you can of ways in which thermometers are used. Ask your mother and father to help you.

3. Study the newspapers to find where the temperature is reported. Bring to class a newspaper clipping that tells about the temperature outdoors.

4. Keep track of the temperature in the schoolroom each hour for one day. Find the average temperature for the day.

5. Keep track of the temperature in the schoolroom each day when you come to school for one week. Find the average temperature at that time for the week.

Time for Practice

Copy these examples and write the sums:

	a	b	c	d	e	f
1.	25	63	69	79	28	38
	21	79	80	68	37	58
	19	91	31	39	58	76
	20	48	57	88	48	29
	26	26	50	75	95	85
2.	$.46	$.10	$.26	$.37	$.41	$.99
	.76	.27	.20	.72	.85	.60
	.67	.63	.38	.84	.96	.72
	.85	.48	.93	.65	.15	.87
	.77	.59	.53	.14	.40	.30

TWO-PLACE MULTIPLIERS WITHOUT ZEROS

May was planning her flower garden. She wanted to plant 32 bulbs in each row and to have 14 rows. She asked how many bulbs she needed. Can you help her?

To multiply 32 by 14, we can multiply 32 by 4 ones and 32 by 1 ten and add the products.

A

Under **A** we have the example.

$$\begin{array}{r} 32 \\ \times 14 \\ \hline \end{array}$$

B

Under **B** we have multiplied 32 by the 4 ones. Four 2's are 8. The 8 is written in the ones' place. Four 3's are 12. This is 12 tens because we multiplied 3 tens. We write the 12 tens as 2 tens and 1 hundred.

$$\begin{array}{r} 32 \\ \times 4 \\ \hline 128 \end{array}$$

C

Under **C** we have multiplied 32 by the 1 ten. Because there are no ones, we write 0 in the ones' place. The 0 is the place holder. One 2 is 2. We write the 2 in the tens' place. One 3 is 3. We write the 3 in the hundreds' place.

$$\begin{array}{r} 32 \\ \times 10 \\ \hline 320 \end{array}$$

D

Under **D** we have multiplied 32 by 14. Here we put together the steps shown under **B** and **C.** Notice that the product of 10×32 is written directly under the product of 4×32. Then these two products are added to give the product of 14×32.

$$\begin{array}{r} 32 \\ \times 14 \\ \hline 128 \\ 320 \\ \hline 448 \end{array}$$

E

Under **E** we show the best way to write the example. We do not write the 0 when we multiply by the 1 ten. We only think it. Always write your work as you see it under **E.**

$$\begin{array}{r} 32 \\ \times 14 \\ \hline 128 \\ 32 \\ \hline 448 \end{array}$$

Copy these examples and find the products:

	a	b	c	d	e	f
1.	12	23	12	45	44	11
	×21	×13	×43	×11	×12	×66
2.	32	62	64	83	71	92
	×13	×24	×22	×23	×65	×44
3.	41	78	12	91	81	72
	×47	×11	×34	×38	×79	×33

MORE TWO-PLACE MULTIPLIERS

When we multiply by a two-place number it is important to remember two things.

First, we multiply by the figure in the ones' place.

Second, we multiply by the figure in the tens' place. We write the product in a new row. The numbers in the new row begin in the tens' place.

Study the two examples. Example **A** shows that we could start the second row in the ones' place. We could write a 0 in the ones' place of the second row to show that we have already multiplied by the ones' figure. This 0 holds the ones' place. But our written work should look like Example **B.**

A	B
42	42
23	23
126	126
840	84
966	966

Copy the examples in Exercises **1** to **3** and find the products:

	a	b	c	d	e	f
1.	14	48	41	37	49	21
	×21	×30	×19	×50	×80	×38

	a	b	c	d	e	f
2.	47	12	52	46	32	84
	×21	×32	×43	×11	×90	×12
3.	61	11	91	67	82	53
	×68	×60	×12	×40	×33	×70

GOING TO SCHOOL ON A BUS

(Multiplication problems)

Work these problems. Show all your work on your paper.

1. Ben lives 7 miles from town. He rides to the town school on a bus. How many miles does he ride going to and from school each day?

2. How many miles does Ben ride each week to and from school?

3. The bus driver told Ben that the bus traveled 36 miles each day on its route to and from school. How far does the bus travel each week?

4. The driver said that it cost 7¢ to drive the bus a mile. How much did it cost to drive the bus each week?

5. Ben went to school 22 days in one month. How many miles did he ride on the school bus during the month?

6. If the bus traveled 180 miles in a week, how far did it travel in 4 weeks?

CARRYING WITH TWO-PLACE MULTIPLIERS

Carrying when we multiply by a two-place number is just the same as carrying when we multiply by a one-place number.

To multiply 36 × 47, we can multiply 6 × 47 and 30 × 47 and add the two products.

Under **A** we have the example.

A

$$\begin{array}{r} 47 \\ \times 36 \\ \hline \end{array}$$

Under **B** we have multiplied 47 by 6. Tell how we get the product 282.

B

$$\begin{array}{r} 47 \\ \times 6 \\ \hline 282 \end{array}$$

Under **C** we have multiplied 47 by 30. Tell how we get the product 1410.

C

$$\begin{array}{r} 47 \\ \times 30 \\ \hline 1410 \end{array}$$

Under **D** we have multiplied 47 by 36. Here we have put together the steps shown under **B** and **C.** Why did we omit the 0 in 1410, which is shown under **C?**

D

$$\begin{array}{r} 47 \\ \times 36 \\ \hline 282 \\ 141 \\ \hline 1692 \end{array}$$

Now work the examples on page 270.

Copy these examples and find the products:

	a	b	c	d	e	f
1.	47	63	82	79	68	45
	×31	×29	×47	×38	×15	×62
2.	19	38	27	42	59	21
	×93	×46	×46	×58	×49	×93
3.	72	86	93	58	74	39
	×57	×63	×27	×85	×29	×58
4.	65	74	43	35	28	39
	×37	×69	×54	×13	×69	×16
5.	71	56	92	63	84	34
	×42	×87	×72	×74	×47	×89
6.	37	56	28	56	24	56
	×87	×69	×89	×58	×31	×24
7.	57	68	82	15	43	79
	×61	×71	×82	×39	×34	×30
8.	71	10	24	36	44	15
	×56	×45	×24	×63	×29	×51
9.	62	93	20	53	96	78
	×97	×88	×45	×76	×70	×89

DIVISION TEST

(Easier facts)

	a	b	c	d	e	f	g
1.	$2\overline{)2}$	$2\overline{)0}$	$1\overline{)2}$	$2\overline{)4}$	$1\overline{)3}$	$5\overline{)5}$	$5\overline{)10}$
2.	$1\overline{)0}$	$1\overline{)1}$	$3\overline{)12}$	$6\overline{)6}$	$6\overline{)12}$	$2\overline{)8}$	$3\overline{)18}$
3.	$6\overline{)18}$	$9\overline{)9}$	$3\overline{)24}$	$4\overline{)4}$	$4\overline{)0}$	$2\overline{)10}$	$6\overline{)0}$
4.	$1\overline{)5}$	$3\overline{)0}$	$2\overline{)14}$	$7\overline{)0}$	$2\overline{)12}$	$7\overline{)7}$	$4\overline{)8}$
5.	$9\overline{)18}$	$1\overline{)6}$	$7\overline{)21}$	$2\overline{)18}$	$1\overline{)9}$	$3\overline{)6}$	$3\overline{)15}$
6.	$3\overline{)21}$	$3\overline{)9}$	$7\overline{)14}$	$1\overline{)8}$	$8\overline{)8}$	$3\overline{)27}$	$5\overline{)15}$
7.	$9\overline{)27}$	$8\overline{)0}$	$2\overline{)16}$	$8\overline{)24}$	$4\overline{)12}$	$3\overline{)3}$	$9\overline{)0}$
8.	$1\overline{)7}$	$8\overline{)16}$	$2\overline{)6}$	$5\overline{)0}$	$1\overline{)4}$	$4\overline{)16}$	$3\overline{)24}$

DIVISION TEST

(Harder facts)

	a	b	c	d	e	f	g
1.	$8\overline{)32}$	$6\overline{)36}$	$6\overline{)42}$	$8\overline{)40}$	$4\overline{)24}$	$5\overline{)40}$	$9\overline{)36}$
2.	$5\overline{)25}$	$7\overline{)42}$	$7\overline{)28}$	$9\overline{)81}$	$8\overline{)72}$	$7\overline{)49}$	$4\overline{)28}$
3.	$9\overline{)54}$	$6\overline{)30}$	$5\overline{)45}$	$9\overline{)45}$	$6\overline{)24}$	$7\overline{)63}$	$5\overline{)35}$
4.	$6\overline{)54}$	$8\overline{)48}$	$7\overline{)35}$	$6\overline{)48}$	$8\overline{)64}$	$4\overline{)36}$	$9\overline{)63}$
5.	$5\overline{)20}$	$9\overline{)72}$	$4\overline{)20}$	$8\overline{)56}$	$4\overline{)32}$	$5\overline{)30}$	$7\overline{)56}$

THREE-PLACE QUOTIENTS

There were 396 pupils in Longview School. They were divided into 3 groups to sell tickets for the school carnival. How many pupils were there in each group?

Divide the 3 in the hundreds' place by 3. Write the 1 directly above in the hundreds' place. Divide the 9 in the tens' place by 3. Write the 3 directly above in the tens' place. Divide the 6 in the ones' place by 3. Write the 2 directly above in the ones' place. The quotient is 132.

There were 132 pupils in each group.

$$\begin{array}{r} 132 \\ 3\overline{)396} \end{array}$$

Check

$$\begin{array}{r} 132 \\ 3 \\ \hline 396 \end{array}$$

Copy these examples and write the quotients:

	a	b	c	d	e	f
1.	$3\overline{)936}$	$4\overline{)844}$	$5\overline{)505}$	$4\overline{)480}$	$6\overline{)660}$	$4\overline{)808}$
2.	$2\overline{)242}$	$4\overline{)404}$	$3\overline{)369}$	$5\overline{)555}$	$6\overline{)666}$	$2\overline{)842}$
3.	$3\overline{)660}$	$2\overline{)688}$	$5\overline{)500}$	$6\overline{)606}$	$4\overline{)800}$	$2\overline{)426}$

Things to Remember

1. When we multiply a whole number by a whole number we get a larger number in the answer.

2. When we divide a whole number by a whole number we get a smaller number in the answer than the number we are dividing.

3. When we add whole numbers we get a larger number in the answer.

4. When we subtract a whole number from a whole number we get an answer that is smaller than the number subtracted from.

MORE WORK WITH AVERAGES

John counted the number of blocks he rode his bicycle each day for a week. He wanted to know the average number of blocks he rode each day. To find the average, John added to find the total number of blocks. The total is 84. Then he divided by 7, the number of numbers added, to find the average number of blocks he rode each day.

Sunday	7 blocks	
Monday	13 blocks	
Tuesday	14 blocks	12
Wednesday	8 blocks	7)84
Thursday	16 blocks	7
Friday	14 blocks	14
Saturday	12 blocks	14
Total	84	
	Average	12 blocks

To find the average, we must do two things: (1) add to get the sum and (2) divide by the number of numbers to get the average.

Work these problems. Show all your work on your paper.

1. These were Carol's scores on five spelling tests: 8, 13, 12, 10, 7. What was Carol's average per day?

2. John saved his earnings each week for six weeks. He saved 35¢, 48¢, 73¢, 60¢, 82¢, and 86¢. How much did he save per week on the average?

3. Phyllis counted the number of tulips in bloom in each row of her flower garden. There were 18, 21, 14, 21, 17, 16, and 19. What was the average number in bloom per row?

THREE-PLACE QUOTIENTS AS MONEY NUMBERS

One morning six boys picked berries. They were paid $8.70 for the work. They shared the money equally. How much did each boy receive?

This example is worked just as we have worked other examples. Study the example at the right.

Work these problems. Show all your work on your paper. Be sure to place the decimal point of the quotient directly above the decimal point of the dividend.

```
   $1.45
6)$8.70
   6
   ---
   2 7
   2 4
   ---
     30
     30
     --
```

Check

```
$1.45
    6
-----
$8.70
```

1. Five yards of cloth cost $7.50. How much did the cloth cost per yard?

2. Golf balls were sold three for $1.98. How much was this for one ball?

3. How much will each of four boys be paid if all four together earn $6.48 and each receives the same amount?

4. Richard worked six weeks for a neighbor and was paid $10.80. How much did he earn per week?

5. Mary bought three pounds of coffee for her mother and paid $1.29. How much was this per pound?

6. John bought eight rolls of camera film to take on a camping trip. He paid $3.36. If each roll cost the same amount, how much did each roll cost?

7. Hazel was class treasurer. She paid $5.22 for nine quarts of ice cream that the class bought for a party. If each quart cost the same amount, how much was this for a quart?

8. Robert raised rabbits. He sold eight for $9.28. How much was this for each rabbit if he was paid the same amount for each rabbit?

REVIEWING UNEVEN DIVISION

Copy these examples and find the answers. If you have forgotten how to do uneven division, study the example at the right. Show all your work on your paper. Check by multiplying.

$$\begin{array}{r} 61 \\ 3\overline{)185} \\ \underline{18} \\ 5 \\ \underline{3} \\ 2 \end{array}$$

Check

$$\begin{array}{r} 61 \\ \underline{\times 3} \\ 183 \end{array} \qquad \begin{array}{r} 183 \\ \underline{+2} \\ 185 \end{array}$$

	a	b	c	d	e
1.	$4\overline{)369}$	$6\overline{)427}$	$8\overline{)179}$	$7\overline{)142}$	$6\overline{)487}$
2.	$8\overline{)329}$	$9\overline{)195}$	$7\overline{)359}$	$5\overline{)402}$	$9\overline{)476}$
3.	$8\overline{)265}$	$5\overline{)457}$	$8\overline{)485}$	$6\overline{)279}$	$9\overline{)276}$

PROBLEMS THAT ARE DIFFERENT

(Enrichment material)

Below are some examples that have some of the figures missing. Wherever there is a missing figure there is a dot. Copy each example, but in place of each dot write a figure so that the answer will be correct. You may have to add, subtract, or multiply to get the answer.

	a	b	c	d	e
1.	47	19	2•	92	••
	2•	1•	4	•1	25
	75	2	96	21	55
2.	••9	4•8	8••	4••	••2•
	271	•8•	654	3	949
	910	215	157	1275	4375

HELPING WITH THE HOUSEWORK

(Division problems)

1. Every Saturday morning Alice and Fay helped their mother clean the house. One Saturday their mother said, "I want all these old magazines arranged in 8 equal piles and tied into bundles." The girls counted the magazines. There were 168. How many magazines did they put in each bundle?

2. Then Alice and Fay arranged empty fruit jars on a cupboard shelf. There were 9 shelves and 200 jars. If they tried to put the same number of jars on each shelf, how many jars would they have to put on each shelf? How many jars would be left over?

3. Next the girls took the books from the shelves in the library and dusted them. There were 8 shelves and 112 books. How many books were there for each shelf if they put an equal number on each?

★**4.** The girls were told to leave one shelf bare. How many books then had to be placed on each shelf if they put an equal number on each?

QUESTIONS THAT ARITHMETIC PROBLEMS ASK

(Help in problem solving)

The arithmetic problems that you have to solve almost always ask you to find one of six things:

1. What is the total number?

2. What is the number left or gone?

3. What is the difference between two numbers?

4. What is the other part of a number?

5. What is the number in each equal share of a larger number?

6. How many times does one number contain a smaller number or how many times is a smaller number contained in a larger number?

If you read problems carefully, you will see that you usually have to answer one of these six questions. The words will not be just as they are in the six questions above, but they will mean the same.

A problem always asks a question. We must decide what question is asked.

Read the following problems. Tell which of the six questions is asked in each problem. Then work the problem. Show all your work on your paper.

1. Albert read the speedometer on his family's car one Sunday morning. It read 23,478 miles. The next Sunday it read 24,014 miles. How far did the car go that week?

2. Jim runs errands after school to make money. One week he earned 20 cents on Monday, 45 cents on Tuesday, 10 cents on Wednesday, 25 cents on Thursday, and 35 cents on Friday. How much did he earn altogether that week?

3. Susan wants a new doll that costs $5.95 and a doll bed that costs $4.87. How much must she save before she can buy them?

4. Mr. Clark gave Tom, Harry, and Bill a bag of marbles. There were 48 marbles in it. The boys shared the marbles equally. How many marbles did each boy get?

5. Clifford had saved $18.90 for a new bicycle that would cost $39.50. How much more did he have to save to buy the bicycle?

6. Harry has 400 beets to put in bunches of 5. How many bunches can he make?

7. The school year was 180 days long. There were only 27 school days until vacation. How many school days had gone by?

8. Caroline helped her mother can fruit. She knew that there were 185 empty fruit jars in the basement but that 19 were cracked. How many of the jars were good?

9. Peter bought 7 rabbits. He paid $1.63 each. How much did he pay for all the rabbits?

10. John's book had 64 pages. He read half of them. How many pages did he have left to read?

Time for Practice

Copy these examples and find the quotients. Check by multiplying.

	a	b	c	d	e
1.	3)$3.36	5)$1.50	4)$1.64	3)$9.60	6)$6.60
2.	2)$2.24	4)$4.80	7)$7.21	6)$8.40	5)$7.00
3.	8)$9.60	6)$9.60	3)$7.20	9)$1.80	7)$1.40
4.	6)$7.86	9)$9.90	8)$7.60	7)$8.40	8)$8.64

HOW WARM IS IT?

(Temperature of cities)

The table at the right shows the degrees of temperature in nine American cities on one day in June.

City	Temperature
Austin	84
Buffalo	72
Cleveland	80
Hartford	72
Kansas City	85
Memphis	88
Portland, Me.	68
Salt Lake City	70
St. Louis	84

1. Which was the warmest city on this day?

2. Which was coolest?

3. What was the difference in temperature for these two cities?

4. How much warmer was Cleveland than Salt Lake City?

5. How much cooler was Hartford than St. Louis?

6. What was the average temperature for Austin, Buffalo, Cleveland, and Hartford?

7. Find the average temperature for the other cities.

8. What was the average temperature for all nine cities?

★**9.** Record the temperature reported in your paper for your town or city each morning for five days and find the average temperature for these days.

Time for Practice

Copy these examples and subtract:

	a	b	c	d
1.	761 28	5820 697	4993 1798	337 40
2.	914 907	6225 693	7146 428	8058 7059

ZERO IN A THREE-PLACE QUOTIENT

Marie had 618 stamps for her collection. She arranged them in groups of 6 each. How many groups did Marie have?

To answer this question, we must divide. The dividend, 618, is six hundreds, one ten, and eight ones.

First we divide the 6 hundreds by 6. We write 1 in the hundreds' place in the quotient. We multiply. We subtract. There is no remainder. We bring down the 1 ten. There are zero 6's in 1; so we write 0 in the tens' place of the quotient.

Now we bring down the 8 ones. How many 6's are there in 18 ones? There are 3. We write the 3 in the ones' place of the quotient. We multiply. We subtract. There is no remainder.

$$\begin{array}{r} 103 \\ 6\overline{)618} \\ \underline{6} \\ 18 \\ \underline{18} \end{array}$$

Check

$$\begin{array}{r} 103 \\ \underline{\times 6} \\ 618 \end{array}$$

The quotient is 103.

Marie had 103 groups of stamps.

We check by multiplying 103 by 6. The product is 618. The quotient is correct.

When the number we bring down in any place cannot be divided, we must be sure to write zero in that place in the quotient.

Copy these examples and divide. Check your answers. Show all your work on your paper.

	a	b	c	d	e	f
1.	$5\overline{)525}$	$3\overline{)315}$	$6\overline{)612}$	$3\overline{)627}$	$2\overline{)816}$	$4\overline{)436}$
2.	$4\overline{)408}$	$5\overline{)540}$	$6\overline{)636}$	$4\overline{)828}$	$7\overline{)749}$	$6\overline{)624}$
3.	$6\overline{)630}$	$4\overline{)816}$	$7\overline{)707}$	$6\overline{)642}$	$7\overline{)763}$	$7\overline{)756}$

THREE-PLACE QUOTIENTS IN UNEVEN DIVISION

When we divide a three-place number by a one-place number we may have a remainder just as we sometimes do in other division examples.

Study the example at the right and explain each step. What is the remainder? Check the example to see if the answer is correct. What do we do with the remainder when we check division?

```
   114
4)457
   4
   5
   4
  17
  16
   1
```

Copy these examples and find the quotients:

	a	b	c	d	e	f
1.	3)637	5)538	7)848	6)729	4)957	8)889
2.	7)918	9)904	6)847	8)963	7)748	9)956

DIVISION PROBLEMS

Work these problems. Show all your work on your paper.

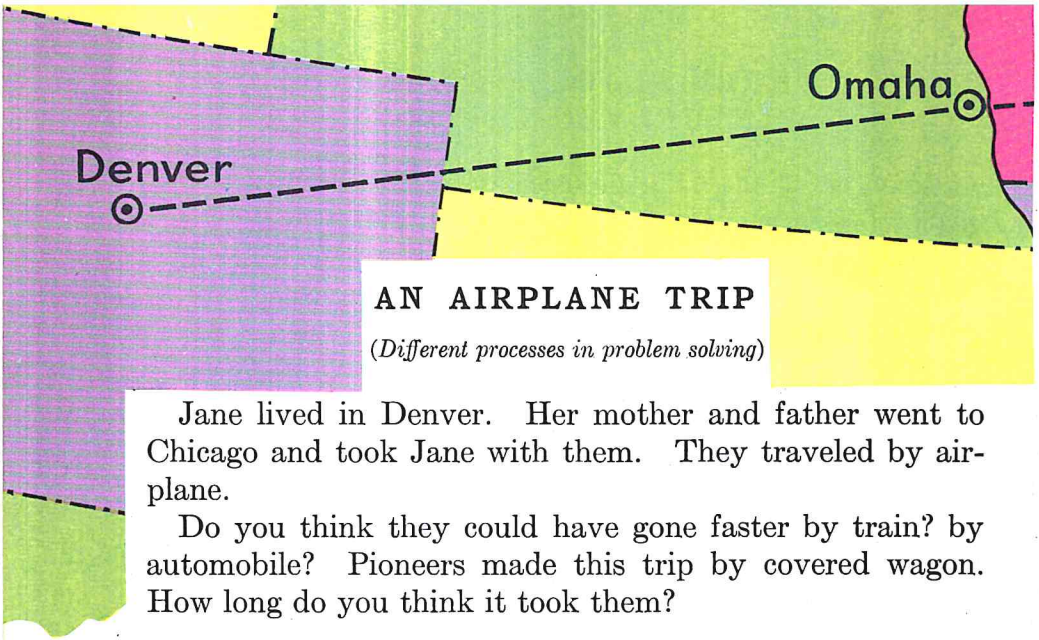
1. Mary had 48 books to arrange on 4 bookshelves. How many books could she put on each shelf if she put the same number on each shelf?

2. John had a collection of 147 butterflies. They were arranged in 7 cases. How many were there in each case if there were the same number in each?

3. The boys in the school were arranged in playground cleanup squads. There were 8 squads and 176 boys in the school. How many boys were there in each squad?

4. There were 40 weeks in the school year. How many weeks did each squad of boys work if the weeks were divided equally among them?

5. Ralph delivered papers on a paper route. In 8 weeks he earned 32 dollars. How much did he earn on the average each week?



AN AIRPLANE TRIP

(Different processes in problem solving)

Jane lived in Denver. Her mother and father went to Chicago and took Jane with them. They traveled by airplane.

Do you think they could have gone faster by train? by automobile? Pioneers made this trip by covered wagon. How long do you think it took them?

These are some facts that Jane learned:

Chicago is 918 miles from Denver.
The airplane traveled 180 miles an hour.
The airplane carried 36 passengers.
Each ticket cost $35.
The airplane made one stop, at Omaha.
Omaha is 485 miles from Denver.

Find the answers to these questions about the airplane trip. Show all your work on your paper.

1. How much did Jane's father pay for three tickets?

2. How far is it from Omaha to Chicago?

3. All the seats were filled when the airplane left Denver. Fourteen passengers got off at Omaha. How many passengers stayed on the airplane?

4. The fare from Denver to Omaha was $21. How much did the passengers who got off at Omaha pay all together?

5. How far could the airplane travel in seven hours?

6. The airplane stopped 30 minutes in Omaha. How far could it go in that time?

7. Seven people got on at Omaha. How many rode from Omaha to Chicago?

8. How many empty seats were there from Omaha to Chicago?

9. The fare from Omaha to Chicago was $16. If the empty seats had been filled, how much more money would the airline company have received?

10. If each passenger who got on the airplane at Omaha took 40 pounds of baggage, how much did all their baggage weigh?

11. How far is it from Denver to Chicago and back to Omaha?

12. If the airplane could carry 44 passengers from Denver to Chicago, how much would be paid for all the tickets?

Time for Practice

Copy these examples and find the quotients. Check by multiplying.

	a	b	c	d	e	f
1.	4)392	2)471	6)246	5)210	7)336	8)864
2.	6)672	5)774	4)426	9)262	6)722	9)693
3.	7)616	9)891	8)289	7)870	8)552	8)746

Do You Know?

Write the answers to these questions:

1. What is a thermometer?

2. What are four ways in which people use thermometers?

3. What two arithmetic processes do you use when you find an average?

4. When you find an average, which arithmetic process do you use first?

5. Why do people pay taxes?

6. What are three things on which people pay a tax?

7. What is a triangle? a rectangle? a square?

REASONABLE NUMBERS

(Enrichment material)

Are these sentences reasonable?

1. John carried home from the grocery store a sack of sugar that weighed 100 pounds.

2. Marie said that she could hold her breath for six minutes.

3. Olive's new desk is 5 yards long.

4. Peter said that the playground was 4 feet wide and 4 feet long.

5. The storybook was 6 inches wide.

6. Ruth wrote with a pencil that weighed 16 ounces.

Something is reasonable when it could be true. It may not be true, but it could be. When we use numbers they should be reasonable.

7. Write three reasonable sentences that use numbers and three unreasonable sentences that use numbers.

HOW MUCH HAVE YOU LEARNED?

(Chapter Test 9)

Copy these examples and write the answers:

	a	b	c	d	e
1.	421 $\times 6$	\$8.13 $\times 7$	3021 $\times 8$	\$5.17 $\times 8$	6380 $\times 9$
2.	6)\$6.06	7)910	9)274	8)\$1.68	7)749

	a	b	c	d
3.	20×37	43×81	56×79	48×67
4.	$567 \div 5$	$856 \div 7$	$776 \div 9$	$960 \div 8$

5. Subtract: $4067 - 358$

6. Find the average of 100, 90, 120, 85, 130.

IMPROVE YOUR SKILLS

(Diagnostic Test 8)

Work each set of examples. If you miss more than one example in any set, you need to review.

1. 469 $+157$ 387 $+456$ 328 $+894$ **(175)**

2. Add: **(182)**

\$ 4.67		
.58		
16.21		
\$ .83	\$5.10	
1.98	.98	
.50	3.25	
11.00		

3. 6243 -4118 5847 -1272 5836 -4684 **(185)**

4. $\frac{1}{2} + \frac{1}{2}$ $\frac{3}{8} + \frac{1}{8}$ $\frac{1}{3} + \frac{2}{3}$ **(240)**

5. 6406 $\times 8$ 3234 $\times 7$ 4356 $\times 9$ **(259)**

6. 31 $\times 15$ 42 $\times 24$ 51 $\times 38$ **(266)**

7. 4)816 6)636 7)721 **(280)**

HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 9)

Work these problems. Show all your work on your paper.

1. These were Jim's scores on four spelling tests: 8, 12, 10, 6. What was his average score?

2. Kathy helped her father set out cabbage plants. They had 12 rows with 36 plants in each row. How many plants did Kathy and her father set out?

3. One morning at 8 o'clock the thermometer showed 37 degrees. The next morning it showed 56 degrees at 8 o'clock. How much warmer was the second morning?

4. Mann School bought new science books for the pupils in Martin's room. Each book cost 82 cents. There were 26 pupils. How much did all the new science books cost?

5. Washington School was given a picture to hang in the hall. Each of the six classes paid an equal share of the cost of framing. The total cost of the framing was $9.60. How much did each class pay?

6. The pupils in Miss White's room collected $1.84 to pay their share of the picture framing. How much money did they have left?

7. Chris set out 180 tomato plants in 9 equal rows. How many plants did Chris set out in each row?

8. Four hundred twenty-four pupils in Park School bought tickets for the circus. They were divided into eight equal groups to travel to the circus by bus. How many pupils were there in each group?

9. Don worked for three weeks. The first week he earned $5.10, the second week $8.05, and the third week $6.95. How much did he earn all together?

10. Thirty-two boys in a scout troop paid 25¢ each for a camp fund. How much was collected?

DO YOU LEARN AND REMEMBER?

(Progress Test 8)

1. Write these numbers in words:

743 47,302 6094 58,090 2500 17,840

2. Write these times with numbers and letters:

a. Nine o'clock in the morning

b. Twenty minutes after seven in the evening

c. Thirty minutes before noon

d. Two hours after midnight

3. Add these numbers:

a. 741, 1050, 19, 7037

b. 15, 846, 7, 5043

c. 28, 6750, 583, 42

4. Write the multiplication facts for 9 through 9×9.

5. Write the division facts for 8 through $72 \div 8$.

6. Write the money number that tells how much each of the following is:

a. Three dimes and one nickel

b. One half dollar and one quarter

c. One dollar bill, 4 dimes, and 3 pennies

d. One quarter, one dime, one nickel, and one penny

Copy these examples and write the answers:

	a	b	c	d
7.	38×7	416×6	528×4	907×5
8.	$6\overline{)66}$	$4\overline{)82}$	$5\overline{)565}$	$7\overline{)148}$

CHAPTER X

Thinking About This Book

PLANNING A VACATION

1. Irene was going to spend the summer on Uncle Dan's farm. Uncle Dan said that he would pay her 50¢ each day if she helped Aunt Flora with her work. How much will Irene earn each week if she works each day except Sunday? How much will she earn in nine weeks?

2. David planned to go to Yellowstone Park with his parents. It was 1640 miles from their home. David's father said that their car would go 20 miles for each gallon of gasoline used and that they would use 82 gallons to go to the Park. Check to see if this is correct. How much gasoline would they need to drive to the Park and back?

3. Billy's father told him that he would pay him 75¢ each week if he kept the yard mowed. How much will Billy earn in 12 weeks?

4. Marie had been saving her money to buy a bicycle. She opened her bank and counted $43.78. She found that the bicycle she wanted cost $38.95. How much would she have left for other things?

5. Don planned to raise tomatoes in the garden. He said that he would sell the tomatoes to his mother and neighbors in the fall. Don set out 60 plants. They cost him 7¢ each. How much did he pay for his plants? If he sold the tomatoes for $32, how much would he have left after paying for the plants?

6. Sarah said that her cousin would visit her. The cousin would arrive June 24 and go home July 6. How many days, counting June 24 and July 6, would they have to visit? Tell from a calendar for this year on what days of the week the cousin will come and go home.

★**7.** Make up two problems about your vacation plans. Write them and find the answers. Show all your work on your paper.

THE WEIGHT CHART

Name	Pounds in October	Pounds in May
James	76	80
Phyllis	66	71
Ann	76	79
Richard	73	78
Tom	85	88
Judith	74	78

The chart shows how many pounds six pupils in Miss John's room weighed in October and in May.

1. Which pupil weighed the most in October? in May? Which pupil weighed the least in October? in May?

2. Which boy gained the most? the least?

3. Which girl gained the most? the least?

4. What was the average weight of the girls in October? in May?

5. What was the average weight of the boys in October? in May?

Time for Practice

Copy these examples and find the answers. Check all your work.

	a	b	c	d
1.	$535 - 5$	$374 - 68$	$89 + 10 + 4$	19×68
2.	$\frac{1}{2}$ of 6	47×58	$721 \div 7$	39×47
3.	$737 + 9 + 20$	84×36	$721 - 86$	56×70

AT THE FILLING STATION

(Different processes in problem solving)

Harry and Phyllis were going with their parents on a trip. Their father took the car to the service station to get it ready for the trip.

1. The children's father had 10 gallons of gasoline put in the car. It cost 26 cents per gallon. How much did the gasoline cost?

2. The oil in the car was changed. The car needed 5 quarts of oil. The oil cost 35 cents per quart. How much did the 5 quarts cost?

3. The car was washed and greased. Washing cost $1.75 and greasing $.95. What was the total bill for gasoline, oil, washing, and greasing?

4. The children's father gave the owner of the station a ten-dollar bill. How much change should he have received?

5. The owner put a sticker on the car. The sticker said that the oil had been changed when the car had gone 47,382 miles. Write this number in words.

6. Write the number of quarts there are in 10 gallons.

7. Write the number of gallons there are in 5 quarts.

Time for Practice

Copy these examples and write the differences:

	a	b	c	d	e
1.	8132	$13.02	8713	$97.14	1293
	7387	7.85	244	10.98	329
2.	$10.87	579	158	$89.11	$1.40
	1.14	399	60	46.05	.93

MAKING A BUDGET

After the taxes were taken out, Mr. Riley earned $250 per month. He and Mrs. Riley and their two children made a **budget** to help them spend wisely. Look up **budget** in your dictionary to find out what it means.

This is the way the Riley family decided the money should be spent each month:

Rent	$ 50
Fuel and electricity	20
Groceries	70
Car	22
Clothing	30
Entertainment	10
Insurance and savings	20
Miscellaneous	28
Total	$250

1. What are some of the expenses that would have to be paid from "Miscellaneous"?

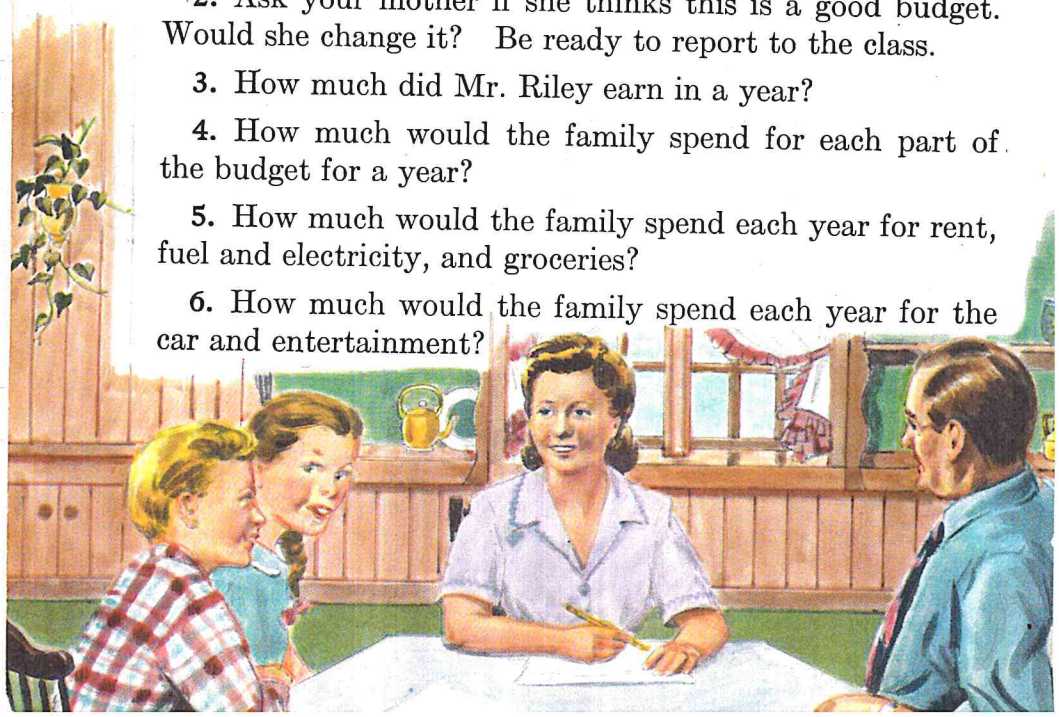
2. Ask your mother if she thinks this is a good budget. Would she change it? Be ready to report to the class.

3. How much did Mr. Riley earn in a year?

4. How much would the family spend for each part of the budget for a year?

5. How much would the family spend each year for rent, fuel and electricity, and groceries?

6. How much would the family spend each year for the car and entertainment?



ZERO IN THE MULTIPLICAND AND THE MULTIPLIER

Have you ever tried to multiply two two-place numbers with zero in the ones' place of each number? It is not hard to do if we remember this:

Zero times any number or any number times zero gives a product of zero. When we multiply zero by zero, the product is zero.

Study the example at the right. Tell how we get the product 1200.

$$\begin{array}{r} 60 \\ \times 20 \\ \hline 1200 \end{array}$$

Copy these examples and find the products:

	a	b	c	d	e	f
1.	$\begin{array}{r} 80 \\ \times 30 \\ \hline \end{array}$	$\begin{array}{r} 50 \\ \times 20 \\ \hline \end{array}$	$\begin{array}{r} 20 \\ \times 50 \\ \hline \end{array}$	$\begin{array}{r} 60 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 70 \\ \times 40 \\ \hline \end{array}$	$\begin{array}{r} 40 \\ \times 90 \\ \hline \end{array}$
2.	$\begin{array}{r} 30 \\ \times 60 \\ \hline \end{array}$	$\begin{array}{r} 20 \\ \times 70 \\ \hline \end{array}$	$\begin{array}{r} 80 \\ \times 40 \\ \hline \end{array}$	$\begin{array}{r} 70 \\ \times 80 \\ \hline \end{array}$	$\begin{array}{r} 90 \\ \times 20 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 50 \\ \hline \end{array}$

Do It Quickly

Write only the answers:

1. How many days are there in a week?
2. How many months are there in a year?
3. What letters do we use for "before noon"?
4. What letters do we use for "after noon"?
5. How many feet are there in a yard?
6. How many yards are there in a mile?
7. How many inches are there in a foot?
8. How many inches are there in a yard?
9. How many seconds are there in an hour?
10. The running track at Chestnut Street School is a quarter-mile track. It is 440 yards long. How many feet long is it?

A FISHING TRIP

(Different processes in problem solving)

Kenneth went on a fishing trip with his father and his uncle. They fished two days. On the first day Kenneth caught 3 fish, his father caught 7, and his uncle caught 9. On the second day Kenneth caught 6 fish, his father caught 4, and his uncle caught 7.

1. How many fish were caught in the two days?

2. One fourth of the fish weighed more than one pound. Three fourths weighed less than one pound. How many weighed more than one pound?

3. Kenneth said that he would clean the fish. It took him 6 minutes to clean each of the fish that weighed more than one pound. How many minutes did it take him to clean all the larger fish?

4. It took Kenneth 4 minutes to clean each of the smaller fish. How many minutes did it take him to clean all the fish that weighed less than a pound?

5. How many more minutes did it take to clean the small fish than the larger fish?

6. When Kenneth and his father and uncle got home, they divided the fish into six equal groups so that they could give some of the fish to friends. How many fish were there in each group?

Time for Practice

Copy these examples and find the products:

	a	b	c	d
1. Multiply by 27:	38	19	42	70
2. Multiply by 18:	63	59	40	87
3. Multiply by 39:	75	16	82	93
4. Multiply by 46:	60	88	97	45
5. Multiply by 57:	56	48	92	76
6. Multiply by 96:	77	94	80	65

Time for Practice

Copy these examples and find the quotients. Check your work.

	a	b	c	d	e
1. Divide by 4:	840	148	408	440	$4.84
2. Divide by 7:	707	140	714	770	$1.47
3. Divide by 3:	339	930	906	639	$3.96
4. Divide by 6:	660	120	366	312	$6.06

Copy these examples and find the products. Check your work.

	a	b	c	d
5. Multiply by 7:	406	381	543	$2.43
6. Multiply by 8:	172	463	458	$7.09
7. Multiply by 6:	347	815	927	$2.65
8. Multiply by 9:	762	751	408	$3.94

Without Paper and Pencil

1. Is $\frac{1}{4}$ of an apple more or less than $\frac{1}{2}$ of an apple?

2. Is $\frac{1}{6}$ of an orange more or less than $\frac{2}{3}$ of an orange?

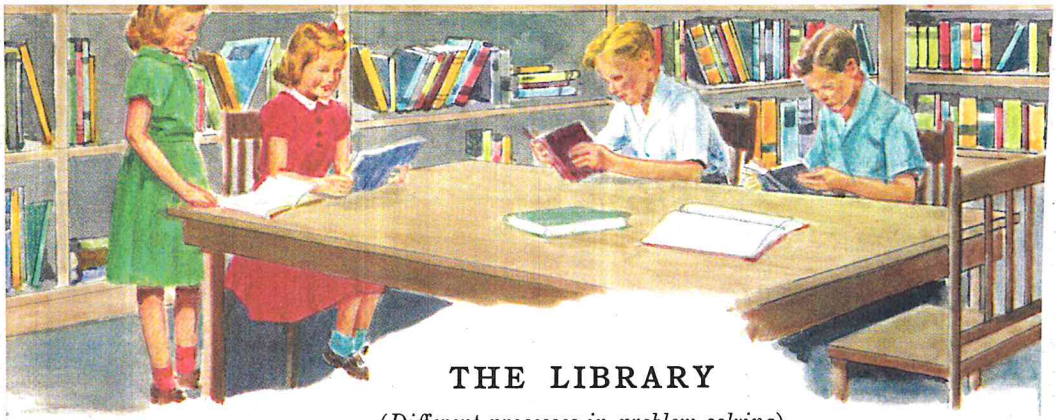
3. Is $\frac{1}{3}$ of a pie more or less than $\frac{1}{9}$ of a pie?

4. Is $\frac{3}{4}$ of a cake more or less than $\frac{1}{2}$ of a cake?

5. Is one half of a dollar more or less than one fourth of a dollar?

6. How do we write one half of a dollar? one fourth of a dollar?

	a	b	c
7.	$\frac{1}{2}$ of $4=?$	$\frac{1}{2}$ of $8=?$	$\frac{1}{3}$ of $9=?$
8.	$\frac{1}{3}$ of $6=?$	$\frac{1}{2}$ of $2=?$	$\frac{1}{2}$ of $6=?$



THE LIBRARY

(Different processes in problem solving)

Each Thursday afternoon the pupils in Miss Howe's room went to the public library to get books that they could read at home.

1. There were 28 pupils in the class. Each pupil could get 5 books. How many books could they take all together?

2. The pupils were divided into groups of four to go to the different bookshelves. How many groups were there?

3. Each pupil made a deposit of 25 cents to pay for books that might be lost. How much did all the pupils pay together?

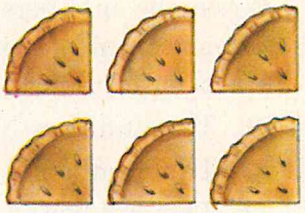
4. On Saturdays four of the pupils helped in the library. They put books back on the shelves. On one Saturday Mary replaced 87 books, Phyllis replaced 93 books, Ann replaced 68 books, and Eva replaced 103 books. How many did they replace all together?

5. The librarian told the girls that there were 34,382 books in the library. Write this number in words.

6. One year the library spent $16,249 for books. Write this amount of money in words.

★**7.** The pupils gave a gift of money to the library so that it could buy some new books. Seven pupils brought 10¢ each. Five brought 15¢ each. Eight brought 20¢ each. Eight brought 25¢ each. How much money did the pupils give to the library?

Fractions Are Parts of Wholes



1. a. How many of these pieces are needed to make a whole pie?

b. How many whole pies can be made from these pieces?

c. How many pieces will be left over?

2. a. How many of the quart containers full of milk will it take to fill the gallon jug?

b. How much will be left?

c. How many more quart containers would you need to fill two jugs?

Time for Practice

Copy these examples and subtract:

	a	b	c	d	e
1.	842	$84.20	6415	589	$1.06
	576	31.05	4525	63	.45
2.	711	1536	6417	$1.40	1063
	506	928	2087	.93	905

Copy these examples and add:

	a	b	c	d	e
3.	12	1035	$8.26	8	$ .52
	957	544	2.52	56	6.15
	64	673	2.68	304	4.84
	736	98	3.83	30	.28

FINDING THE RIGHT WORD

Write the numbers 1 to 10 on a sheet of paper. Then after each number write the word or words that should go where the question mark is in each sentence.

1. The numbers X and V are called —?— numbers.
2. The numbers 8 and 3 are called —?— numbers.
3. The numbers $\frac{3}{4}$ and $\frac{1}{5}$ are called —?—.
4. In the number $21.50 the dot between the 1 and the 5 is called the —?—.
5. In the number 4862 the 8 is in the —?— place.
6. The answer in addition is called the —?—.
7. To find the difference between two numbers, we must —?—.
8. The answer in division is called the —?—.
9. In the number 70,431 the 1 is in the —?— place.
10. The answer in multiplication is called the —?—.

Time for Practice

Copy these examples and write the sums:

	a	b	c	d	e
1.	84	832	49	4	19
	296	21	81	15	710
	37	12	19	305	57
	640	267	466	80	86
	87	97	774	908	155
2.	404	53	2745	18	2257
	1837	1150	29	71	2638
	96	486	644	343	502
	54	94	105	79	369
	129	35	24	97	43

Time for Practice

Copy these examples and write the answers:

	a	b	c	d
1. Divide by 5:	430	290	105	395
2. Multiply by 6:	584	167	703	829
3. Divide by 9:	729	432	621	108
4. Multiply by 9:	865	617	842	309
5. Divide by 8:	424	712	384	128

Copy these examples and write the products:

	a	b	c	d	e	f
6.	$\begin{array}{r} 58 \\ \times 31 \\ \hline \end{array}$	$\begin{array}{r} 71 \\ \times 24 \\ \hline \end{array}$	$\begin{array}{r} 39 \\ \times 32 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ \times 40 \\ \hline \end{array}$	$\begin{array}{r} 54 \\ \times 56 \\ \hline \end{array}$	$\begin{array}{r} 40 \\ \times 86 \\ \hline \end{array}$
7.	$\begin{array}{r} 22 \\ \times 14 \\ \hline \end{array}$	$\begin{array}{r} 80 \\ \times 53 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ \times 69 \\ \hline \end{array}$	$\begin{array}{r} 49 \\ \times 75 \\ \hline \end{array}$	$\begin{array}{r} 65 \\ \times 98 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ \times 77 \\ \hline \end{array}$
8.	$\begin{array}{r} 70 \\ \times 20 \\ \hline \end{array}$	$\begin{array}{r} 38 \\ \times 19 \\ \hline \end{array}$	$\begin{array}{r} 61 \\ \times 92 \\ \hline \end{array}$	$\begin{array}{r} 97 \\ \times 78 \\ \hline \end{array}$	$\begin{array}{r} 50 \\ \times 40 \\ \hline \end{array}$	$\begin{array}{r} 42 \\ \times 68 \\ \hline \end{array}$

Copy these examples and write the answers:

	a	b	c	d	e	f
9.	$4\overline{)216}$	$6\overline{)546}$	$5\overline{)485}$	$8\overline{)104}$	$7\overline{)644}$	$9\overline{)738}$
10.	$5\overline{)388}$	$7\overline{)451}$	$4\overline{)346}$	$6\overline{)327}$	$9\overline{)599}$	$8\overline{)681}$
11.	$7\overline{)770}$	$3\overline{)690}$	$5\overline{)545}$	$8\overline{)816}$	$9\overline{)990}$	$6\overline{)659}$
12.	$8\overline{)797}$	$4\overline{)377}$	$3\overline{)262}$	$6\overline{)585}$	$7\overline{)542}$	$9\overline{)871}$

MAKING VALENTINES

(Different processes in problem solving)

One Saturday before St. Valentine's day Martha, Joan, Frances, and Sue met at Sue's home to make valentines. They found that they had to use arithmetic. Work these problems, which the girls had to work. Show all your work on your paper.

1. Sue's mother gave the girls 24 sheets of colored paper. The girls divided the sheets equally. How many sheets did each girl get?

2. They found that they could cut seven hearts from each sheet. How many hearts could they make from all 24 sheets?

3. Joan cut each of her sheets of paper in half. How many pieces did she then have?

4. Frances used $\frac{1}{3}$ of her sheets of paper to make arrows. How many sheets of paper did she use?

5. Sue used only one of her sheets for hearts. What fractional part of all Sue's sheets was one sheet?

6. Eight of the 24 sheets of paper were red. What fractional part of all the sheets was 8 sheets?

★**7.** Martha cut $\frac{1}{2}$ of her sheets into fourths. How many pieces did she have after these sheets had been cut?

EXAMPLES THAT ARE DIFFERENT

(Enrichment material)

The following examples are different from any you have had in this book. In each box there are three examples worked out. In the fourth example one part is missing. You are to decide what that part should be by studying the three other examples. Do not work the fourth example in each box. If you look at the other three carefully, you can tell what the missing part in the fourth example should be. Copy the numbers in each box and write the missing part.

	a	b
1.	$3 \times 37 = 111$ $6 \times 37 = 222$ $9 \times 37 = 333$ $12 \times 37 =$ —?—	$18 \times 37 = 666$ $21 \times 37 = 777$ $24 \times 37 = 888$ $27 \times 37 =$ —?—
2.	$1 \times 8 + 1 = 9$ $12 \times 8 + 2 = 98$ $123 \times 8 + 3 = 987$ $1234 \times 8 + 4 =$ —?—	$1 \times 9 + 2 = 11$ $12 \times 9 + 3 = 111$ $123 \times 9 + 4 = 1111$ —?— $\times 9 + 5 = 11{,}111$
3.	$9 \times 9 + 7 = 88$ $98 \times 9 + 6 = 888$ $987 \times 9 + 5 = 8888$ —?— $\times 9 + 4 = 88{,}888$	$28 \times 15{,}873 = 444{,}444$ $35 \times 15{,}873 = 555{,}555$ $42 \times 15{,}873 = 666{,}666$ —?— $\times 15{,}873 = 777{,}777$
4.	$9 \times 22 + 2 = 200$ $9 \times 33 + 3 = 300$ $9 \times 44 + 4 = 400$ $9 \times$ —?— $+ 5 = 500$	$1 \times 7 + 1 = 8$ $12 \times 7 + 2 = 86$ $123 \times 7 + 3 = 864$ $1234 \times 7 + 4 =$ —?—

REVIEWING SOME ARITHMETIC WORDS

Below and on page 303 you will find some questions to which four answers have been given. Only one answer is right. Three answers are wrong.

Example: How are eggs usually sold? By the (**a**) peck, (**b**) bushel, (**c**) dozen, (**d**) quart.

The answer is **dozen,** because eggs are sold by the dozen.

Write the numbers 1 to 15 down the left side of your paper. Then write the correct answer to each question.

1. What is the word that tells what shape this page is? (**a**) circle, (**b**) rectangle, (**c**) square, (**d**) triangle

2. What is the word that tells what the shape of a bicycle wheel is? (**a**) circle, (**b**) rectangle, (**c**) square, (**d**) triangle

3. What is the word that tells what shape this box is? (**a**) circle, (**b**) rectangle, (**c**) square, (**d**) triangle

4. What is the word that tells what shape this figure is? (**a**) circle, (**b**) rectangle, (**c**) square, (**d**) triangle

5. Which of these pieces of land is generally the largest? (**a**) township, (**b**) county, (**c**) section, (**d**) state

6. Which is longest? (**a**) 4 weeks, (**b**) 1 month, (**c**) 35 days, (**d**) 48 hours

7. Which is longest? (**a**) 60 weeks, (**b**) 12 months, (**c**) 200 days, (**d**) 1 year

8. Which usually costs the most to buy? (**a**) new car, (**b**) house, (**c**) radio, (**d**) watch

9. Which usually costs the least to buy? (**a**) newspaper, (**b**) magazine, (**c**) book, (**d**) notebook

10. Which of these things does a dressmaker use for measuring? (**a**) ruler, (**b**) scale, (**c**) tape measure, (**d**) degree

11. Which of these things does a grocer use most often? (**a**) ruler, (**b**) scale, (**c**) quart measure, (**d**) bushel basket

12. What is used to measure the amount of electricity used in a house each month? (**a**) thermometer, (**b**) meter, (**c**) speedometer, (**d**) calendar

13. What word tells what heat is measured by? (**a**) inches, (**b**) degrees, (**c**) minutes, (**d**) points

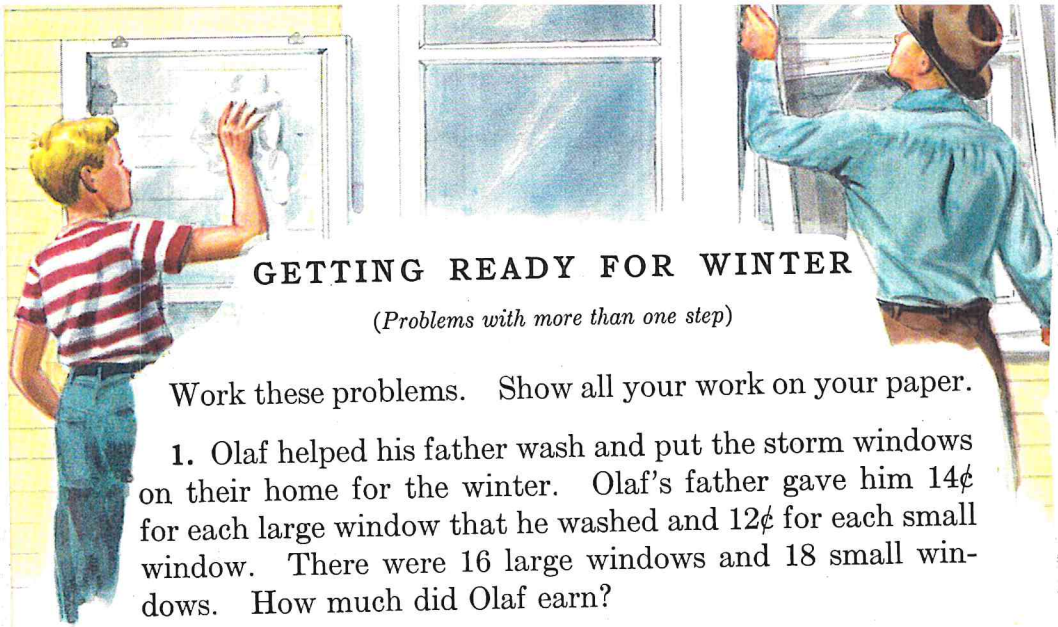
14. In what is a farm usually measured? (**a**) square feet, (**b**) square rods, (**c**) scores, (**d**) acres

15. What word tells how distance from one city to another is measured? (**a**) feet, (**b**) yards, (**c**) rods, (**d**) miles

Time for Practice

Copy these examples and find the answers:

	a	b	c
1.	$7\overline{)658}$	$561 \div 9$	$8470 - 986$
2.	47×39	56×87	$9\overline{)837}$
3.	$8\overline{)889}$	$699 \div 8$	$7\overline{)588}$
4.	$\frac{1}{3}$ of 9	83×91	$\frac{2}{3} - \frac{1}{3}$
5.	$438 + 7 + 93 + 7460$	$231 \div 7$	90×80
6.	$\frac{1}{4}$ of 8	$406 \div 6$	$\frac{3}{4} - \frac{1}{4}$
7.	27×60	$7\overline{)287}$	48×63
8.	$777 \div 8$	8×6527	9×4307
9.	$7629 - 587$	29×46	$9\overline{)489}$
10.	\$.18 + \$4.79 + \$.05 + \$47.23		\$.13 + \$4.28 + \$.02



GETTING READY FOR WINTER

(Problems with more than one step)

Work these problems. Show all your work on your paper.

1. Olaf helped his father wash and put the storm windows on their home for the winter. Olaf's father gave him 14¢ for each large window that he washed and 12¢ for each small window. There were 16 large windows and 18 small windows. How much did Olaf earn?

2. It took Olaf 15 minutes to wash each large window and 10 minutes to wash each small window. How many minutes did it take him to wash all the windows?

3. It took Olaf another hour to help his father get the windows ready for hanging. Counting the minutes he spent washing the windows and this hour, find how many minutes Olaf worked all together.

Time for Practice

Copy these examples and write the answers:

	a	b	c	d
1.	$322 \div 4$	5×8261	$708 \div 7$	$8 + 908 + 23$
2.	$8\overline{)654}$	$\frac{1}{5}$ of 5	7×439	\$10.00 − \$4.98
3.	$4\overline{)424}$	$239 \div 2$	9×6074	$809 - 13$
4.	8×532	$704 - 95$	$137 \div 9$	$8\overline{)232}$

HOW MUCH HAVE YOU LEARNED?

(Chapter Test 10)

	a	b	c	d
1.	$\begin{array}{r} 38 \\ \times 47 \\ \hline \end{array}$	$\begin{array}{r} 4375 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 6930 \\ -967 \\ \hline \end{array}$	$\begin{array}{r} 8435 \\ +6792 \\ \hline \end{array}$

2. a. $\frac{1}{3}$ of 9 oranges = ? b. Add: 34, 9007, 402, 63

	a	b	c
3.	$659 \div 8$	6×582	$7\overline{)644}$
4.	$1 - \frac{1}{4}$	60×70	$568 \div 9$
5.	$\begin{array}{r} \$48.20 \\ -19.67 \\ \hline \end{array}$	$\begin{array}{r} \$30.07 \\ +9.84 \\ \hline \end{array}$	$\begin{array}{r} 40 \\ \times 20 \\ \hline \end{array}$

IMPROVE YOUR SKILLS

(Diagnostic Test 9)

Work each set of examples. If you miss more than one example in any set, you need to review.

1. $5\overline{)67}$ $7\overline{)94}$ $6\overline{)87}$ **(148)**

2. $\frac{2}{3} - \frac{1}{3}$ $\frac{3}{4} - \frac{1}{4}$ $1 - \frac{1}{2}$ **(243)**

3. **(168)**

34	49	55
68	31	19
53	67	48
75	28	20

4. Find the average of: **(260)**
   a. 4, 9, 3, 8
   b. 15, 21, 36, 44
   c. 5, 8, 9, 13, 10

5. **(262)**

$\begin{array}{r} 28 \\ \times 30 \\ \hline \end{array}$	$\begin{array}{r} 19 \\ \times 50 \\ \hline \end{array}$	$\begin{array}{r} 36 \\ \times 70 \\ \hline \end{array}$

6. **(269)**

$\begin{array}{r} 48 \\ \times 24 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ \times 35 \\ \hline \end{array}$	$\begin{array}{r} 63 \\ \times 46 \\ \hline \end{array}$

7. $6\overline{)673}$ $9\overline{)948}$ **(281)**
   $7\overline{)864}$

HOW WELL CAN YOU WORK PROBLEMS?

(Problem Test 10)

Work these problems. Show all your work on your paper.

1. Albert bought a new flashlight for $1.95, a knife for $1.35, and a ball for $.65. How much change should he have received from a ten-dollar bill?

2. Don's family spent an average of $68 per month for groceries. How much did the family spend in a year for groceries?

3. There were 4 persons in Don's family. How much did the food cost for each person each month?

4. Tom wanted to buy a basketball that cost $5.95 and a camera that cost $7.35. He had saved $8.50. How much more did Tom need to save?

5. Sue counted the books on six shelves in her home. These were the numbers of books on each shelf: 22, 35, 19, 41, 40, 17. How many books did each shelf average?

6. Thirty-seven children in Miss David's room bought tickets for the circus. The tickets cost 75¢ each. How much did all the tickets cost?

7. Judy bought a new pair of skating shoes. They cost $12.50. Her mother gave the clerk two ten-dollar bills. How much change should she have received?

8. Katherine paid $6.80 for eight music lessons. How much did each lesson cost?

9. A truck driver unloaded 73 sacks of flour at the grocery store. Each sack weighed 48 pounds. How much did the flour weigh all together?

10. Tim read 16 pages of a book one evening, 28 pages the next evening, and 17 pages the third evening. There were 147 pages in the book. How many pages did Tim have left to read?

DO YOU LEARN AND REMEMBER?

(Progress Test 9)

Copy these examples and write the answers:

1. Find the average of: (a) 5, 11, 19, 2, 18
   (b) 47, 22, 50, 41

	a	b	c	d
2.	Add: 4872, 349, 687, 5491	Subtract: 4961 − 2975	Add: \$19.20, 75.00, 3.50, 7.98	Multiply: \$4.73 × 9
3.	19 × 27	60 × 30	495 × 8	6872 × 7
4.	6)74	5)155	8)416	7)503
5.	$\frac{1}{2} + \frac{1}{2}$	$\frac{3}{4} - \frac{1}{4}$	$\frac{3}{8} + \frac{1}{8}$	$1 - \frac{1}{2}$
6.	$\frac{1}{4}$ of 8	$\frac{1}{6}$ of 18	$\frac{1}{2}$ of 28	$\frac{1}{3}$ of 36
7.	\$85.17 − 3.25	\$.80 − .05	3)\$3.75	\$17.10 − 7.95

Write only the answers:

8. How many hours are there in a day?
9. How many years are there in a century?
10. Name the days of the week.
11. Name the months of the year.
12. How many feet are there in a mile?
13. What is the distance around a surface called?
14. How many inches are there in a yard?

TABLES OF MEASURES

Measures of Length

12 inches (in.) = 1 foot (ft.)
3 feet = 1 yard (yd.)
36 inches = 1 yard

5280 feet = 1 mile (mi)
1760 yards = 1 mile

Measures of Weight

16 ounces (oz.) = 1 pound (lb.)
2000 pounds = 1 ton (t.)

Liquid Measure

16 ounces (oz.) = 1 pint (pt.)
2 pints = 1 quart (qt.)
4 quarts = 1 gallon (gal.)

Time

60 seconds (sec.) = 1 minute (min.)
60 minutes = 1 hour (hr.)
24 hours = 1 day (da.)
7 days = 1 week (wk.)
12 months (mo.) = 1 year (yr.)

365 days = 1 year
366 days = 1 leap year
100 years = 1 century

Money

5 cents = 1 nickel
10 cents = 1 dime
25 cents = 1 quarter dollar
50 cents = 1 half dollar

100 cents = 1 dollar
20 nickels = 1 dollar
10 dimes = 1 dollar
4 quarters = 1 dollar

The Months

January (Jan.).....31 days
February (Feb.)....28 or 29 days
March (Mar.).....31 days
April (Apr.).....30 days
May.....31 days
June.....30 days
July.....31 days
August (Aug.).....31 days
September (Sept.)..30 days
October (Oct.).....31 days
November (Nov.)..30 days
December (Dec.)....31 days

THE ADDITION FACTS

0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
1	1	1	1	1	1	1	1	1	1
0	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
2	2	2	2	2	2	2	2	2	2
0	1	2	3	4	5	6	7	8	9
2	3	4	5	6	7	8	9	10	11
3	3	3	3	3	3	3	3	3	3
0	1	2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	10	11	12
4	4	4	4	4	4	4	4	4	4
0	1	2	3	4	5	6	7	8	9
4	5	6	7	8	9	10	11	12	13
5	5	5	5	5	5	5	5	5	5
0	1	2	3	4	5	6	7	8	9
5	6	7	8	9	10	11	12	13	14
6	6	6	6	6	6	6	6	6	6
0	1	2	3	4	5	6	7	8	9
6	7	8	9	10	11	12	13	14	15
7	7	7	7	7	7	7	7	7	7
0	1	2	3	4	5	6	7	8	9
7	8	9	10	11	12	13	14	15	16
8	8	8	8	8	8	8	8	8	8
0	1	2	3	4	5	6	7	8	9
8	9	10	11	12	13	14	15	16	17
9	9	9	9	9	9	9	9	9	9
0	1	2	3	4	5	6	7	8	9
9	10	11	12	13	14	15	16	17	18

THE SUBTRACTION FACTS

0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
1	1	1	1	1	1	1	1	1	1
0	1	2	3	4	5	6	7	8	9
2	3	4	5	6	7	8	9	10	11
2	2	2	2	2	2	2	2	2	2
0	1	2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	10	11	12
3	3	3	3	3	3	3	3	3	3
0	1	2	3	4	5	6	7	8	9
4	5	6	7	8	9	10	11	12	13
4	4	4	4	4	4	4	4	4	4
0	1	2	3	4	5	6	7	8	9
5	6	7	8	9	10	11	12	13	14
5	5	5	5	5	5	5	5	5	5
0	1	2	3	4	5	6	7	8	9
6	7	8	9	10	11	12	13	14	15
6	6	6	6	6	6	6	6	6	6
0	1	2	3	4	5	6	7	8	9
7	8	9	10	11	12	13	14	15	16
7	7	7	7	7	7	7	7	7	7
0	1	2	3	4	5	6	7	8	9
8	9	10	11	12	13	14	15	16	17
8	8	8	8	8	8	8	8	8	8
0	1	2	3	4	5	6	7	8	9
9	10	11	12	13	14	15	16	17	18
9	9	9	9	9	9	9	9	9	9
0	1	2	3	4	5	6	7	8	9

THE MULTIPLICATION FACTS

0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	1	2	3	4	5	6	7	8	9
1	1	1	1	1	1	1	1	1	1
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
2	2	2	2	2	2	2	2	2	2
0	2	4	6	8	10	12	14	16	18
0	1	2	3	4	5	6	7	8	9
3	3	3	3	3	3	3	3	3	3
0	3	6	9	12	15	18	21	24	27
0	1	2	3	4	5	6	7	8	9
4	4	4	4	4	4	4	4	4	4
0	4	8	12	16	20	24	28	32	36
0	1	2	3	4	5	6	7	8	9
5	5	5	5	5	5	5	5	5	5
0	5	10	15	20	25	30	35	40	45
0	1	2	3	4	5	6	7	8	9
6	6	6	6	6	6	6	6	6	6
0	6	12	18	24	30	36	42	48	54
0	1	2	3	4	5	6	7	8	9
7	7	7	7	7	7	7	7	7	7
0	7	14	21	28	35	42	49	56	63
0	1	2	3	4	5	6	7	8	9
8	8	8	8	8	8	8	8	8	8
0	8	16	24	32	40	48	56	64	72
0	1	2	3	4	5	6	7	8	9
9	9	9	9	9	9	9	9	9	9
0	9	18	27	36	45	54	63	72	81

THE DIVISION FACTS

$1\overline{)0}$ = 0	$1\overline{)1}$ = 1	$1\overline{)2}$ = 2	$1\overline{)3}$ = 3	$1\overline{)4}$ = 4	$1\overline{)5}$ = 5	$1\overline{)6}$ = 6	$1\overline{)7}$ = 7	$1\overline{)8}$ = 8	$1\overline{)9}$ = 9
$2\overline{)0}$ = 0	$2\overline{)2}$ = 1	$2\overline{)4}$ = 2	$2\overline{)6}$ = 3	$2\overline{)8}$ = 4	$2\overline{)10}$ = 5	$2\overline{)12}$ = 6	$2\overline{)14}$ = 7	$2\overline{)16}$ = 8	$2\overline{)18}$ = 9
$3\overline{)0}$ = 0	$3\overline{)3}$ = 1	$3\overline{)6}$ = 2	$3\overline{)9}$ = 3	$3\overline{)12}$ = 4	$3\overline{)15}$ = 5	$3\overline{)18}$ = 6	$3\overline{)21}$ = 7	$3\overline{)24}$ = 8	$3\overline{)27}$ = 9
$4\overline{)0}$ = 0	$4\overline{)4}$ = 1	$4\overline{)8}$ = 2	$4\overline{)12}$ = 3	$4\overline{)16}$ = 4	$4\overline{)20}$ = 5	$4\overline{)24}$ = 6	$4\overline{)28}$ = 7	$4\overline{)32}$ = 8	$4\overline{)63}$ = 9
$5\overline{)0}$ = 0	$5\overline{)5}$ = 1	$5\overline{)10}$ = 2	$5\overline{)15}$ = 3	$5\overline{)20}$ = 4	$5\overline{)25}$ = 5	$5\overline{)30}$ = 6	$5\overline{)35}$ = 7	$5\overline{)40}$ = 8	$5\overline{)45}$ = 9
$6\overline{)0}$ = 0	$6\overline{)6}$ = 1	$6\overline{)12}$ = 2	$6\overline{)18}$ = 3	$6\overline{)24}$ = 4	$6\overline{)30}$ = 5	$6\overline{)36}$ = 6	$6\overline{)42}$ = 7	$6\overline{)48}$ = 8	$6\overline{)54}$ = 9
$7\overline{)0}$ = 0	$7\overline{)7}$ = 1	$7\overline{)14}$ = 2	$7\overline{)21}$ = 3	$7\overline{)28}$ = 4	$7\overline{)35}$ = 5	$7\overline{)42}$ = 6	$7\overline{)49}$ = 7	$7\overline{)56}$ = 8	$7\overline{)63}$ = 9
$8\overline{)0}$ = 0	$8\overline{)8}$ = 1	$8\overline{)16}$ = 2	$8\overline{)24}$ = 3	$8\overline{)32}$ = 4	$8\overline{)40}$ = 5	$8\overline{)48}$ = 6	$8\overline{)56}$ = 7	$8\overline{)64}$ = 8	$8\overline{)72}$ = 9
$9\overline{)0}$ = 0	$9\overline{)9}$ = 1	$9\overline{)18}$ = 2	$9\overline{)27}$ = 3	$9\overline{)36}$ = 4	$9\overline{)45}$ = 5	$9\overline{)54}$ = 6	$9\overline{)63}$ = 7	$9\overline{)72}$ = 8	$9\overline{)81}$ = 9

INDEX

Addition
  carrying in, 15, 18
  checking, 122, 181, 182
  column, 14, 18, 182, 206
  doubles, 11
  facts, 6, 10, 12, 52, 162, 309
  families, 22, 44
  generalizations, 8, 11, 13
  of 1-place numbers, 6, 10
  of 2-place numbers, 15, 165, 166–167, 168
  of 3-place numbers, 17, 175, 179, 181
  of fractions, 240, 246
  of money numbers, 174, 182
  practice, 17, 31, 85, 115, 127, 133, 155, 170, 177, 199, 212, 216, 235, 239, 242, 245, 265, 297, 298
    cards, 6, 7, 10, 11
    mental, 8, 11, 27, 134, 185, 223, 249
    speed, 99, 164
  problems, 7, 16, 24, 51, 142
  relationships to
    multiplication, 34, 50, 52, 58, 120, 132
    multiplication, division, and subtraction, 132
  review, 175, 302
  tests, 18
  zero in, 8
Averages, 260, 273

Borrowing
  from the tens' place, 25, 185
  from the hundreds' place, 26, 185
  from the thousands' place, 190
Budget, 292
Buying, 59, 105, 248–249, 257

Calendar, 63, 66. *See also* Time
Change making, 187
Chapter tests. *See* Tests
Checking
  addition, 122, 181, 182
  division, 103, 108, 122, 149, 152
  multiplication, 122
  subtraction, 20, 122
  review of, 122
Circle, 129
Clock, 83. *See also* Time
Coins, 84–85
Counting
  ordinal, 215
  problems, 4
  savings, 206–207
  tallies in, 99, 100, 136, 145
  mental, 8

Dates, 24, 27
Decimal point, 15, 110
Decimal system, 102
Degree, 264
Diagnostic tests. *See* Tests
Dividend, 152
Division
  by one, 79
  by two, 81
  by three, 41, 81
  by four, 62–63, 64–65
  by five, 71–72, 73–75, 89
  by six, 100
  by seven, 116
  by eight, 203, 205
  by nine, 218

  of a number by itself, 79
  checking, 103, 108, 117, 122, 149, 152
  development of process, 40, 117, 148–149
  facts, 312
    for two, 40, 42, 52
    for three, 41, 42
    for four, 62
    for five, 71–72, 89
    for six, 100
    for seven, 116, 117
    for eight, 203
    for nine, 218
    for zero, 80
    reviewing through five, 92
  families, 44, 52, 63, 89, 100, 203, 220
    practice, 249
  meaning of, 40
  of 2-place numbers, 143, 148
  of 2- and 3-place numbers, 48
  of 3-place numbers, 146, 151–153, 272, 274, 280–281
  of even tens, 46
  of hundreds, 46
  of money numbers, 46, 274
  of a whole object, 47

Division (*Cont.*)
practice, 79, 108, 119, 155, 171, 178, 191, 208, 233, 238, 247, 278, 283, 295, 299
cards, 62, 72, 79, 89, 116, 203
enrichment material, 159, 224
speed, 220, 222
problems, 43, 71, 150, 156, 274, 276, 281, 300
relationships to
addition, multiplication, and subtraction, 132
fractions, 47, 86–87, 144
multiplication, 117, 148, 149
subtraction, 71, 132, 148, 149
review, 109, 123, 143, 275
tests, 43, 272
uneven division,
by two and three, 81
by four, 64–65
by five, 73–75
by six, 101
by seven, 117–118
by eight, 205
by nine, 219
3-place quotients, 281
review, 275
helpers, 65
vocabulary, 64, 152
writing examples, 145
zero in, 80, 154, 280
See also Fractions, relationship to division
Divisor, 73, 152
Dollars and cents, 15, 174
Dot problems, 159, 275

Eighths, 239

Flying, 163, 282–283
Fractional part, 87, 144, 234–235, 241, 251, 297
Fractions
addition of, 240, 246
equivalent fractions, 232–233
of an inch, 236
one eighth, 239
parts in a group, 251
parts in a whole, 234, 297
meaning of, 86, 230
mixed numbers, 230
practice, 87, 229, 231, 235, 241
mental, 295
problems, 229, 231
reading and writing, 217
relationships to
division, 47, 86–87, 144
linear measures, 237–238
liquid measures, 250
reviewing, 119
subtraction of, 243, 246

Gallon, 105, 261. *See also* Liquid measure

Inch, 236–237. *See also* Linear measure

Linear measure, 236–237, 244, 308
Liquid measure, 105, 106, 250, 261, 308
problems, 291

Magic squares, 55, 92
Measure, tables of, 308
Mileage, 153, 186, 199
Money, 308
See also Coins, Dollars and cents, Numbers
Multiplicand, 70
Multiplication
carrying in, 49, 120, 131, 138, 140, 211, 214, 269, 270
checking, 122
development of process, 34, 46
facts, 311
for one, 77
for two, 34
for three, 36
for four, 58, 59, 60
for five, 67, 89, 90
for six, 98, 99
for seven, 112, 113
for eight, 198, 200
for nine, 209, 210
for zero, 45
families, 44, 52, 63, 89, 100, 203, 220
practice, 249
of 2-place numbers, 46, 130, 131, 201, 211, 262–263, 266–267, 269
of 3-place numbers, 50, 138
of 4-place numbers, 259
of money numbers, 141
practice, 51, 70, 108, 111, 114, 134, 138, 168, 171, 178, 191, 202, 217, 233, 238, 247, 270, 278, 294, 295, 299

Multiplication(*Cont.*)
practice (*Cont.*)
cards, 36, 37, 60, 67, 98, 112, 114, 198, 209
enrichment material, 159
mental, 35, 69, 220
speed, 210
problems, 36–37, 51, 57, 68, 69, 142, 201, 268–269
relationships to
addition, 34, 58
addition, division, and subtraction, 132
review, 120, 123, 131
tests, 37, 121, 258
with one, 77
with two, 34, 35
with three, 36
with four, 58, 59, 60
with five, 67, 68, 69, 89
with six, 98, 99
with seven, 112–113
with eight, 198, 200–201, 214
with nine, 209, 210, 214, 294, 295, 297
zero in, 45, 130, 139, 262, 263, 293
Multiplier, 70, 262, 266, 267, 268

Number facts, 12
Number families, 220
Number meanings, 5
Number processes, 132
Number system, 3–4
Numbers,
Arabic, 102
as names, 172
averages, 260, 273
decimal system, 102
enrichment material, 284, 301
in football, 213
in the home, 81
making, 162
mixed, 230
money
adding, 174
budgeting, 292
changing, 187
dividing, 48, 274
multiplying, 141
subtracting, 25
odd and even, 69
ordinal, 215
place value. *See* Place value
reading and writing
division examples, 145
larger numbers, 4, 27, 147
money numbers, 110, 111, 204
practice, 27, 111, 114, 204
problems, 57
Roman, 119, 237

Ounce, 105, 250. *See also* Liquid measure

Perimeter, 173
Pint, 105, 261. *See also* Liquid measure
Place value, 3, 4, 208
Practice, 39, 61, 78, 114, 191, 238, 245, 247, 290, 299, 303, 304
cards, 7
enrichment, 127, 255, 301
speed, 139, 214, 231
See also Addition, Division, Fractions, Multiplication, Numbers, Problems, Subtraction
Problem-solving helps
completing unfinished problems, 172
choosing the right answer, 242
making original problems, 39, 57, 161, 263, 289
naming the answer, 188–189
processes involved, 76, 82–83, 88, 91, 150, 166–167, 263, 282–283, 291, 294, 296, 297
problems with more than one step, 176–177, 304
problems without numbers, 180
practice, 72, 224
vocabulary related to processes, 38, 106–107, 136–137, 142
questions asked, 277–278
Problem-solving tests, 30, 54, 94–95, 126, 157–158, 193–194, 226, 253–254, 286, 306
Problems, 1, 2, 33, 97, 107, 138, 161, 163, 167, 177, 186–187, 192, 197, 206–207, 214, 257, 282–283, 289, 291, 292, 296
dot, 159, 275
puzzle, 138
See also Addition, Division, Fractions, Multiplication, Subtraction
Pound, 105. *See also* Weight
Product, 34, 59, 70
Progress tests. *See* Tests

Quart, 105, 261. *See also* Liquid measure
Quotient, 41, 64, 152, 272, 274

Rectangle, 129, 187
Relationships. *See* Addition, Division, Fractions, Multiplication, Subtraction
Remainder
  in subtraction, 20
  in division, 64, 152
Roman numbers. *See* Numbers
Ruler, 236–237

Scores, 260
Square, 129
Squares, magic, 55, 92
Subtraction
  borrowing, 25, 26, 185, 190
  checking, 20, 122
  facts, 19, 21, 52, 310
  families, 22, 44
  generalizations, 20, 22, 23
  meaning of, 20
  of 1- and 2-place numbers, 19
  of 4-place numbers, 184–185, 190
  of fractions, 243, 246
  of money numbers, 25
  practice, 39, 85, 115, 133, 155, 183, 202, 211, 217, 242, 245, 279, 291, 298
    cards, 19, 21
    enrichment material, 31
  mental, 134, 183
  problems, 24, 33, 150, 163
  relationships to
    addition, division, and multiplication, 132
    division, 71
  tests, 28
  vocabulary, 106
  zero in, 184
Sum, 8

Tables of measures, 308
Tallies, 99, 100, 136, 145
Taxes, 213
Telephone, 181
Temperature, 264–265, 279
Tens
  borrowing from, 25
  division of, 48
  carrying, 49
  multiplication of, 78
Tests
  chapter tests, 29, 52–53, 93, 124, 156, 192, 225, 252, 285, 305
  diagnostic tests, 53, 94, 125, 157, 193, 225, 253, 285, 305
  progress tests, 55, 95, 127, 158–159, 194–195, 227, 254–255, 287, 307
  See also Addition, Division, Multiplication, Subtraction, Problem-solving tests
Thermometers, 264
Thought number, 13
Time, 63, 66, 83, 163, 212, 221, 255, 308
  enrichment material, 255
  table of, 308
Ton, 169
Triangle, 129, 187

Vocabulary, 9, 38, 64, 106, 136–137, 142, 150, 152, 175, 221, 298
  review, 302–303

Wampum, 84
Weight
  chart, 290
  tables, 308

Yard, 244

Zero
  in addition, 8
  in division, 80, 154, 280
  in multiplication, 45, 130, 139, 293
  in subtraction, 20, 184
  practice cards, 80